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TABLE OF CONTENTS ON LAST PAGE OF READING

STATISTICS, STANDARDIZATION AND SAVING

COMING as quite an ironic commentary on our vaunted national efficiency is the statement from the Executive Board of the Federated Engineers' Societies that sheer waste costs the United States a staggering sum. Instancing alone the matter of preventable diseases, the board says that the nation's annual loss through this source is $3,000,000,000. The same authority has data showing that 75 per cent of the serious accidents in industry are avoidable; that unreasonable exactions, restrictions, etc., will cause the country a loss of $500,000,000 in the building trades in 1921; that the textile industry has been getting only 35 per cent efficiency over a term of years through strikes and other wastes, not to mention numerous other industries that are suffering considerably through similar causes.

Over 50 per cent of the losses are laid at the door of industrial managers, and less than 25 per cent are debited against labor. Human energy is still too largely squandered or unutilized, and progress and prosperity must be delayed while 3,000,000 men are idle and consuming their savings. We are forcibly reminded that we must not relax in the least in the general policy of conservation if we are to pass comfortably through the present period of reconstruction and to fortify ourselves properly for the inevitable conflict among the nations for commercial supremacy. Thrift must ever be our watchword, and we must put into practice every possible measure conducive to more efficient production.

Secretary of Commerce Herbert C. Hoover, who is also president of the organization aforementioned, has already shown during his brief incumbency many ways in which the Federal Government can on a large scale not only lessen waste, but actually speed up the work and increase the service of various departments so as to benefit numerous industries particularly and the nation generally. In order to formulate a program for the reduction of waste he is seeking all available information on standardization and simplification; and from the leaders of the major industries or others he welcomes any suggestions that may in any wise be helpful. Particularly has he called upon the Federated Engineers' Societies, which may be fairly said to represent the interests of both capital and labor, to make a careful, impartial survey of the productive agencies of the country, a work which they have promptly undertaken.

It has been remarked by the Secretary that none of the fourteen active bureaus in Washington covers such important items as production, stock, percentage of industrial activity, prices, and monthly reports; and by neglecting to obtain and quickly disseminate such data—the Secretary hates stale statistics—much loss and retardation is occasioned in the nation's business. Apropos to the situation in the rubber industry, the Secretary is of the opinion that—

> If there had been an accurate monthly statement of the current ratio of production, capacity, and operation in the different branches of the industry, and of the stocks of major manufactured and raw materials in hand, they would have been saved tremendous losses, not only in over-accumulation of goods, but also in over-expansion of equipment.

Briefly, the plans for lessening the waste evil are the formation of a national industrial information service, a statistical bureau to report on employment conditions, a national health policy with plans for the employment of defectives, revision of Federal laws retarding stabilization in industry, and a program for the adjustment of labor disputes.

FINANCING FOR EXPORT

STILL further swelling the nation's bulging coffers, about a quarter of a billion dollars' worth of gold has been shipped from Europe to the United States since January 1 of this year to settle trade and war bond debts; and so greatly favorable to this nation is the foreign trade

balance that the chances are that the golden flood will continue this way for a long time to come. Desirable indeed as is the great influx of yellow metal, and flattering as it is to our national pride to be heralded as the earth's greatest creditor—owing five billions before the war and now being owed fifteen billions—the fact must not be overlooked that a nation, like an individual, may even be embarrassed with riches. Nor must we forget that in becoming the world's chief creditor we have assumed obligations that must be discharged if we are to prosper and if our debtors abroad are to have the means for liquidating the claims we hold against them.

We are going to finance Europe. We may be slow about starting, but we are going to do it nevertheless. We shall have to do it in self-protection, or else lose much of the immense foreign trade that cost us such a great effort to build up. Long-term credits must be provided to promote imports and exports; and the sooner the war-spent Europeans get such assistance, the sooner will American manufacturers experience a marked improvement in their overseas commerce. Someone must start the ball rolling, just as in the case of the tire-makers. For months they realized that the time was ripe for a reduction in the prices of tires; they knew that buyers were holding off because they thought prices were too high; but each tire-maker was waiting for the other to make a move. Finally one started and others followed.

Perhaps it would have been better for both sides and for business generally had the price-shading taken place before; but the "buyers' strike" has been fairly well broken and that is an achievement at any rate. So, too, may be found a somewhat analogous condition in our foreign dealings. The trading stalemate will soon be supplanted with active, profitable operations when we prove to our European customers that we are quite as willing to give as to take. Moreover, we cannot afford to hoard the gold that we are collecting from them in enormous quantities. We must do as Great Britain did when it was the world's creditor nation, reinvest with the debtor countries the bulk of the money collected from them. By pursuing such a policy our foreign trade will flourish soon like the proverbial green bay tree, and the golden flood will prove a two-fold blessing instead of an embarrassment.

PROFIT RATHER THAN VOLUME

ONE of the best lessons we learned in war times is that of standardizing methods of manufacturing; cutting out the wasteful frills and getting down to essentials. When the War Industries Board began to regulate production it found that buyers of rubber hose were being offered 139 grades to meet their needs and whims. The board decided that a fraction of that number would serve all useful purposes. So, too, it made sweeping reductions in the 287 sizes and styles of tires, the 325 classes of fruit-jar rings, the innumerable varieties of rubber shoes, not to enumerate the various other rubber productions.

The signing of the armistice abruptly checked the carrying into effect of a standardization program that would have vastly increased the productive power of the nation; but enough had been accomplished to demonstrate its great value, even to indicate that were the manufacturers to get together in real earnest they might almost double the national output without considerable additional effort. But all this means more large-scale specialization and less small-scale diffusion.

As a general principle, the man who makes one article well, both from the standpoint of workmanship and low cost of production, can undersell his rival whose efforts are less well-directed. A small manufacturer may specialize on an exceptional article and win if he has a good shop and low overhead; but the chances are that a middle-class man will fare better by confining himself to staple goods, utilizing specialized machinery, and keeping that going to full capacity. But, it may be asked, how do many of the big, successful rubber companies produce such a diversity of goods? The answer is that they have separate, finely-organized, perfectly-equipped units, practically distinct factories, for each class of goods. Even they are disposed more than ever toward eliminating the least-used varieties and concentrating their capital and endeavors on the production of smaller, more-standardized assortments, obviating much lost motion, and enabling them to figure future business with much more certainty.

A striking illustration of the advantages of specialization and standardization is a big New Jersey concern that found in trying to meet the wants of numerous buyers accustomed to a great profusion of brands and a wide array of styles, it had run its line of manufacture up to an unreasonably high figure. It then decided that henceforth, even though it were to lose some orders, it would simplify and concentrate, and discard small, fussy production that often retarded the execution of large and profitable orders. Nor was it long before the wisdom of such new policy was amply vindicated.

General standardization would be a great step toward national economy, and is no less important in times of peace than in the stress of a world war. It is needed to fortify industrial America against an aggressive and formidable European competition that may be delayed but is still inevitable. It is a road that is but little traveled, yet it is one of the best highways that lead to abiding prosperity.

A RECENT CANVASS OF THE TIRE COMPANIES FOR figures upon puncture of giant cord tires discovers the fact that there are no statistics. The reason is that the big air containers rarely get punctured. The eight to fourteen plies of cord, the heavy layers of cushion stock and tread stock, to say nothing of the breaker strips, make the tire practically unpuncturable. The bigger they are the better they are.

The Manufacture of Dipped Goods

By John Hadfield

THE manufacture of "dipped" goods is commonly conducted as a department in a factory making druggists' rubber sundries, although there are numerous small manufacturers whose entire output is made by the dipping process.

The important rubber goods made by the dipped process are chiefly housekeepers', surgeons', and undertakers' rubber gloves, toy balloons and nursing nipples. These goods contain from 70 to 100 per cent pure rubber by weight and for that reason have great elasticity and toughness, characteristics on which their value chiefly depends.

Dipped goods are cold-vulcanized by either the "acid" or "vapor" cure. For that reason they admit of brighter coloring than goods vulcanized by "hot" vulcanization. If made with expert care dipped goods will render satisfactory service for a reasonable time.

FACTORY PLAN

The manufacture of dipped goods is often conducted in premises and with plant arrangements not best-suited to the work. In addition to conveniently-arranged space and the proper machinery, consideration may profitably be given to providing adequate daylight, effective ventilation, and a scientific air-conditioning system for thoroughly drying the goods in process.

Various floor plans are possible and some may prefer a two-story arrangement to the single-story plan shown in Fig. 1. Provision is made in this plan for a rubber milling and cement-making room; dipping room; finishing room; curing room; stripping, testing and packing rooms.

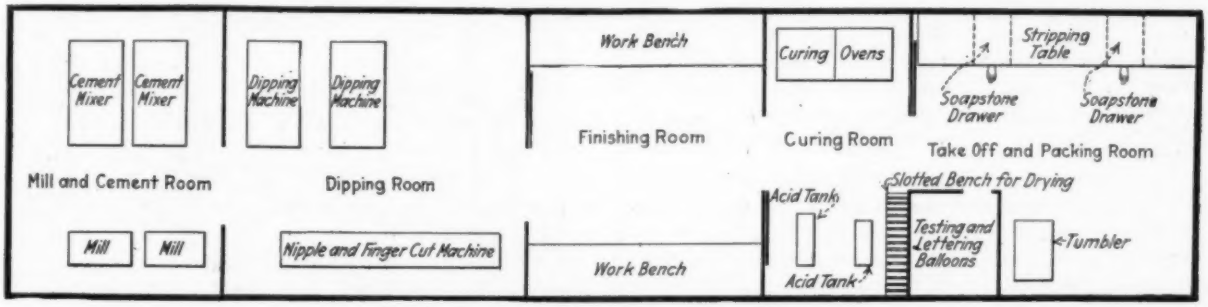


FIG. 1. PLAN OF A MODEL DIPPED GOODS FACTORY

MATERIALS AND PROCESSES

RUBBER

In the manufacture of dipped goods only clean grades of fine and plantation Pará rubber are available. Of these the choice favors Beni Bolivian as yielding goods of superior tensile strength. First latex plantation is essentially as good in this respect and superior for light-colored and transparent goods.

It is essential that the rubber employed be clean and well dried. Breaking down the crude gum is usually limited to 15 to 20 minutes on a warm mill, at which point it is ready for solution if destined for making pure-gum goods. If for balloons or compounded stock the selected proportions of rubber, color and lithopone are milled to a uniform mixture by grinding on a hot mill for about 25 minutes.

COLORS

The colors used are oil-soluble aniline pigments such as red, blue, yellow, black and other colors. White is obtained by means of lithopone. This material is also used in connection with the anilines to dilute and improve the resulting color of clear tints.

In compounded goods, such as gloves for household use, Indian-red oxide or other mineral pigment is used for coloring. Compounding for dipped goods presents simple conditions and few difficulties.

CEMENT

The solution of pure or compounded rubber is known as cement. The solvent employed is 56 to 58-degree naphtha. This grade of naphtha should completely distil under 150 degrees F. and is better suited for use in making cement for dipped goods manufacture than the lighter grades of naphtha or gasoline because it does not volatilize so readily from the dipping tanks, and consequently does not induce bubbles in the goods nor form a crusty gas-filled layer of rubber on the surface of the stock in the dipping tank.

Various styles of machines may be employed for dissolving broken down or compounded rubber to suitable consistency for use in the dipping. One of the best is the enclosed type, one style of which is shown in Fig. 2. In such a tightly-closed, revolving drum-like apparatus, cement may be made of very uniform consistency because the solution chamber is tightly sealed against loss of solvent by evaporation. There is another and more important advantage to be noted, namely, minimizing the fire risk from static electricity.

The proportion of solvent in dipping cement for balloons and pure-gum goods is two gallons to each pound of rubber. In the case of compounded gloves the proportion is 35 gallons to 50 pounds of rubber composition.

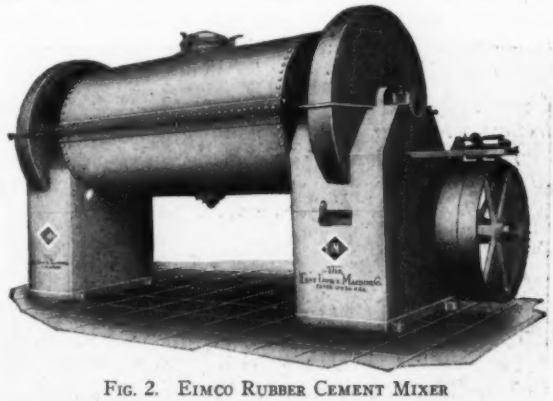


FIG. 2. EIMCO RUBBER CEMENT MIXER

CEMENT FOR TRANSPARENT NIPPLES

Transparent nipples are made from the lightest first latex plantation rubber available. Frequently that from Ceylon is specified. Care must be taken that the gum is not overmilled in breaking down, otherwise it will become darkened. The milled gum is

cut in strips and thrown into the requisite amount of solvent in the cement mixer. Solution may be effected by churning 18 to 20 hours.

When dissolved the cement is drawn into a tall, narrow tank

FIG. 3. MILL ROOM

provided with a quick-opening gate-valve at the bottom and one or more similar valves higher up for testing the clearness of the cement. In a settling tank of this sort the solution is allowed to stand until the impurities are deposited. It is customary to allow 24 hours for settlement, and at the end of that time to draw off the upper half of the cement, passing it through a fine-mesh brass wire screen as a further precaution before transfer to the dipping tank.

The cement remaining in the settling tank is sufficiently clean for the manufacture of pure-gum articles of non-transparent grade. But the additional precaution is always taken to strain it through a fine-mesh brass screen when drawn from the settling tank. Settling impurities from the cement is not practiced for stock intended for goods other than transparent nipples, although it is good practice to strain the cement in any event.

MACHINERY AND PROCESSES

MILLING AND CEMENT MAKING

Fig. 3 shows a mill room containing two mills and two cement mixers. These are of the ordinary types. The cement mixers are preferably of the revolving drum type to prevent loss of solvent by evaporation. In preparing rubber cement for any

FIG. 4. CEMENT MIXERS AND STORAGE TANKS

purpose, precautions should be observed against fire. One of these is not to allow the same man to cut the rubber from the mill and place it in the naphtha-filled churn on account of the danger from static electric discharge. The gum should be cut and laid down by one person, picked up by a second and by him placed in the solvent. Also before opening a tightly-closed cement mixer the pressure of gas should be released at a valve provided for this purpose.

It is not desirable to soak the rubber before starting the mixing mechanism because that serves to mass the gum and make it difficult to operate the stirrers. Dipping cement should be very thoroughly dissolved to a smooth consistency. The process requires from 18 to 20 hours for proper completion.

DIPPING FORMS OR MODELS

The forms for balloons are usually of wood shellacked, and for other articles, of glass or porcelain. Some of these shapes

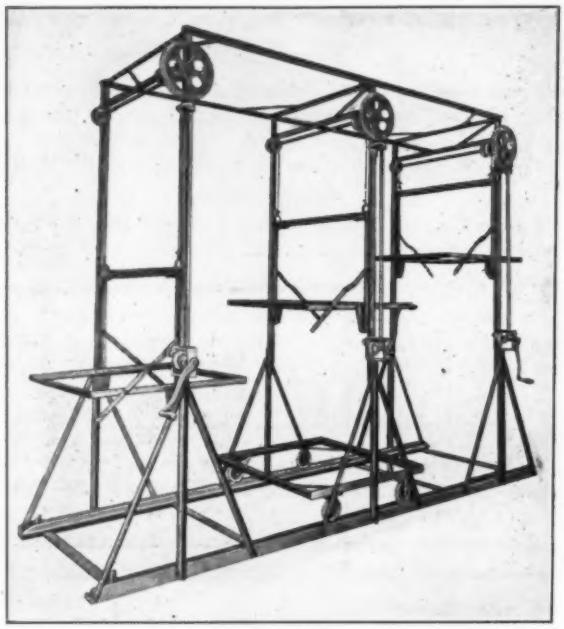


FIG. 5. DIPPING MACHINES—THE ORNAMENTAL IRON WORKS CO.

may be seen in several of the illustrations shown in this article. In service, forms are detachably mounted on bars of wood. The sticks are held in groups for dipping by sliding into grooved cleats on the board seen in Fig. 10.

DIPPING MACHINES

A dipping machine comprises a tank for holding the rubber solution and mechanism for lowering and raising the forms on which the goods are made. Such a machine may be designed either for intermittent or continuous dipping and for work with one or more colors at the same time.

INTERMITTENT DIPPING MACHINES

A battery of three gear-lift, glove-dipping machines is shown in Fig. 5. These machines are equipped with one truck to locate the cement tank under any one of the three lifts which hold the forms and raise and lower them in the process of dipping. For smaller work a single-lift hand-power machine, operated by hand-crank and link-belt, is generally used. A machine of this sort is set on a fixed tank and the reversible rack holds the form-boards on both sides and allows double dipping or alternate dipping and drying from either side of the rack. Machines of this sort may be identified in Fig. 7.

CONTINUOUS DIPPING MACHINE

A recently perfected machine for forming dipped goods continuously is shown in the accompanying illustration. It is in the form of a reel that revolves on a shaft driven by a chain gear-

ing from the main shaft. The reel supports nine shafts with carrying heads, each head composed of a frame holding four sets of forms fastened in grooves *E*. Dipping tanks *B* are filled with the rubber solution, and forms *A* are applied to the boards *C*, which are placed in position in the head of the frame *D*. When the forms are in position cams *F* raise the tanks *B*, causing the forms to be immersed in the solution to a predetermined depth, after which the tanks recede. Then the pinion *G* is moved through about 140 degrees, and the ratchet mechanism advances the carrying head *D* one step, thus bringing the next set of forms in position over the dipping tanks. When this has been accomplished, the set of forms which have already been immersed have been moved forward about 36 degrees, placing the forms almost vertically above their original positions, thus permitting each deposit of solution to dry.

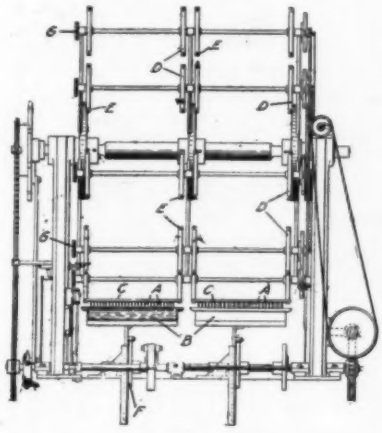


FIG. 6.
MAHONEY'S REVOLVING DIPPING MACHINE

When a sufficient number of immersions have taken place to produce the desired thickness on the forms, the lowermost dipping board of the frame is removed and a new one inserted. In this way the operation of the machine is made continuous.

This machine is designed especially for making nipples, medicine-dropper bulbs, finger-cots and similar goods, but not for gloves.

DIPPING ROOM

In laying out a dipping room the machines for dipping gloves and balloons are arranged around the sides of the room and space is reserved in the center for drying the finished goods. Very essential features in both dipping and finishing rooms are those that guard the tacky goods from injury from dust, insects, and particles of all sorts falling from walls and ceiling, or road dust gaining entrance by the force of wind blowing through open windows or through poorly-fastened window frames. Plenty of sun and a well-planned system of power ventilation are important in drying the product between dippings and before vulcanization.

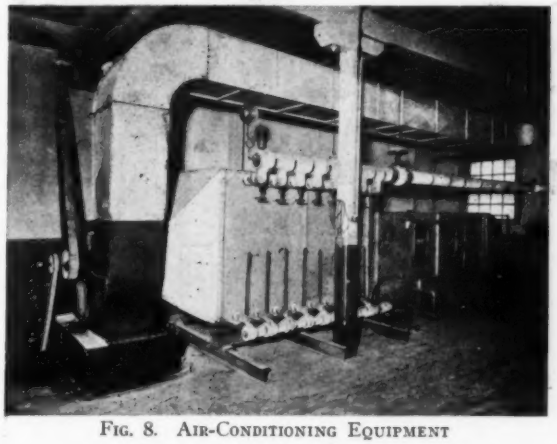


FIG. 8. AIR-CONDITIONING EQUIPMENT

The presence of naphtha in dipped goods during the cure results in a lifeless product lacking in resiliency and consequently cannot be permitted. It can be successfully eliminated only by thorough drying. The drying problem of the dipped goods manufacturer is vital to successful production and he realizes how seriously outdoor weather conditions affect his production processes.

Ideal drying conditions—say 72 degrees F. and 55 per cent relative humidity—can be regularly secured only by an air-conditioning system which circulates clean air under controlled conditions of temperature and relative humidity, making every day a "good day." A typical air-conditioning equipment is shown in Fig. 8. The apparatus comprises the humidifier, heaters, fan and automatic control for both temperature and humidity.

DIPPING PROCESS

Hydrometers or other means of testing liquids fail to give practical indications of the suitability of dipping cement for use, and in this matter dependence is placed entirely on experienced judgment. Loss of evaporation of solvent, which would thicken the cement and tend to crust it over, is minimized by covering the

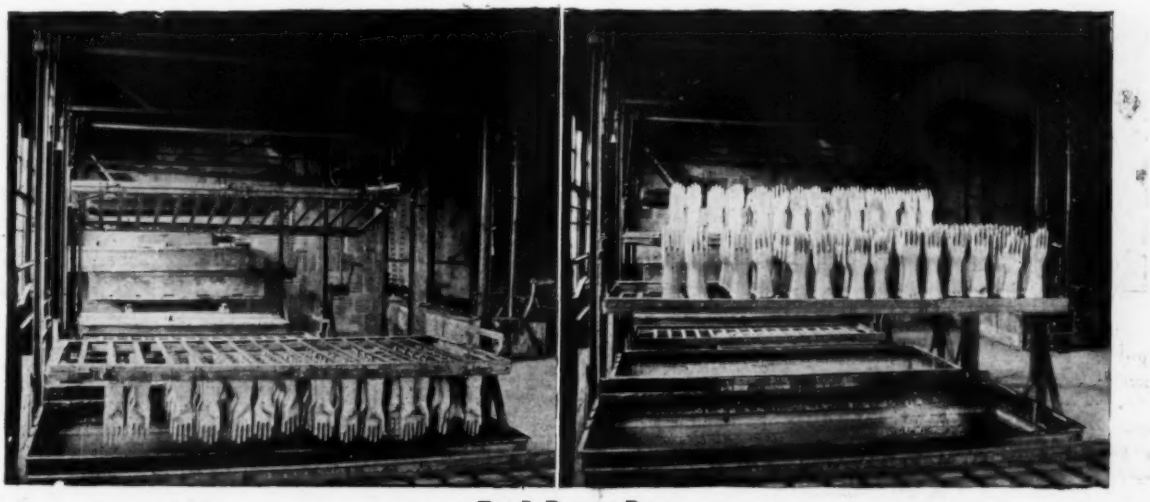


FIG. 7. DIPPING ROOM
GLOVE-FORMS IN POSITION FOR DIPPING — DIPPED GLOVE-FORMS REVERSED FOR DRYING

dipping tank during the intervals between dips, and also by additions of fresh standard cement, or even by stirring in small quantities of solvent as required.

An interval of about one hour between dips is observed in making balloons and nipples, and double that in the case of

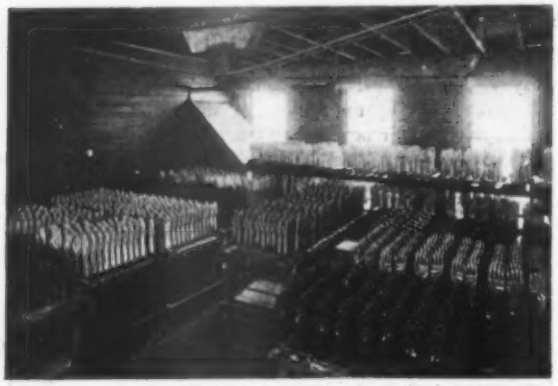


FIG. 9. DRYING ROOM

gloves. This is requisite to permit air carried down by the forms to rise to the surface, or gas from the solvent that may be evolving from the cement. An interval between dips is also needed so that each film of rubber may dry before the next is added. The following table gives the number of dips and intervening lapse of time for various goods:

DIPPING TABLE

Article	Number of Dip Coatings	Interval Between Dippings
Toy balloons	3 to 4	45 minutes
Finger cots	6 to 7	2 hours
Compounded gloves	4	2 hours
Pure-gum gloves	9	2 to 2½ hours
Nipples	10 to 12	1 hour

DRYING

Final drying follows the last dipping to eliminate all the solvent before curing. If done under variable weather conditions, the drying time will vary from eight to 24 hours. By far the better method is to employ conditioned air as described in a preceding paragraph, because in that way the drying process can be

FIG. 10. BALLOON-FINISHING DEPARTMENT

regularly scheduled with saving of time and certainty of production.

Dipped goods, like other rubber products, are made to standard weights and standardization is regulated in the dipping room by test-weighing samples stripped from forms as the dipping nears completion.

FINISHING ROOM

Subsequent to dipping and drying, the goods are taken to the finishing room where the work of forming beaded edges is done by rolling the rubber back upon itself, either by hand or machine, and in the case of gloves by applying strips of rubber as reinforcement around the wrist.

BEAD ROLLING

A patented machine for rolling beads on dipped articles is shown in Fig. 11. In this machine the dry uncured article on its form is made to pass between two yielding rolls of sponge rubber, both of which revolve upward against the edge of rubber which is to be beaded. The form revolves as it passes the rollers. The latter are inclined at an angle with relation to the horizontal passage of the rubber edge of the article and for that reason they roll the edge of the rubber upward only to a definite height, thus forming a rolled-up edge of definite size.

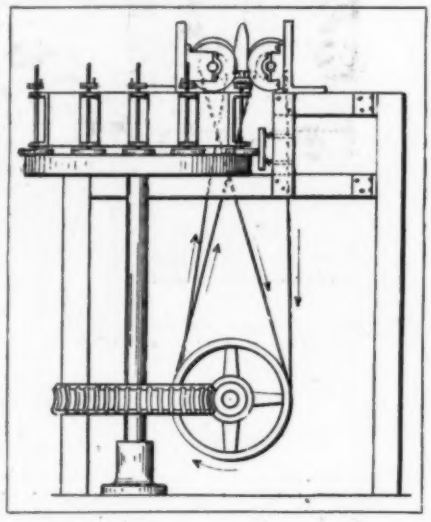


FIG. 11. HADFIELD'S BEAD-ROLLING MACHINE

This machine, when equipped with brush rollers, can be used for stripping small objects like balloons, finger-cots and nipples from their forms after curing, and also for cleaning and polishing forms.

ACID CURE

Vulcanization by the acid-cure is effected by immersion of the dried dipped article on its form into a curing bath consisting of sulphur chloride and carbon bisulphide. The ordinary proportions are four liquid ounces of the former in five gallons of the

FIG. 12. BALLOON-STRIPPING ROOM

latter. The time of immersion necessary for thorough cure varies from 15 to 60 seconds according to the thickness of the rubber. In the case of nipples after acid-curing on the outside they are removed from the forms and curing acid is poured into each to cure the inner surfaces.

VAPOR CURE

Gloves are usually cured by exposure to the vapor of sulphur chloride in an enclosed space at 180 degrees F. for an hour, more

FIG. 13. BINDING AND FINISHING GLOVES

or less, varying with the humidity of the weather. In both acid and vapor-curing it is quite necessary that the goods be thoroughly dry of both naphtha and moisture.

In foggy weather loss by damage due to moisture is practically unavoidable. Another prolific source of trouble by moisture has been traced to water contained in the naphtha. Under some conditions this refuses to settle out and the naphtha presents a foggy appearance. In a case of this sort the naphtha may be rendered clear and all the water separated out of it by the expedient of lowering its temperature to near the freezing point of water.

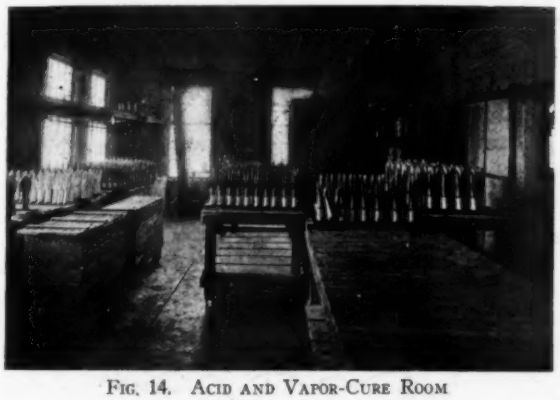


FIG. 14. ACID AND VAPOR-CURE ROOM

STRIPPING ROOM

After curing, the goods proceed to the stripping room where they are dusted with talc, stripped by reversing from their forms, and the talc dust removed by tumbling the articles in a tumbling barrel. Following this the goods are tested and packed for shipment.

FIG. 15. TESTING BALLOONS

COMPARATIVE SUMMARY FOR THE MANUFACTURE OF RUBBER GOODS, 1919 AND 1914

A PRELIMINARY statement of the general results of the 1920 census of manufactures with reference to the rubber industry has been issued by the Bureau of the Census, Department of Commerce. This report consists of establishments engaged principally in the manufacture of all kinds of rubber products during the year 1919.

Reports were received from 475 establishments having a total value of products of $1,138,216,000. In 1914 there were 342 establishments with a total value of products of $300,994,000. Of the 475 establishments reported by the rubber industry in 1920, 96 were located in Ohio; 73 in New Jersey; 56 in Massachusetts; 43 in New York; 32 in Pennsylvania; 26 in Connecticut; 22 in California; 21 in Illinois; 16 in Indiana; 10 in Rhode Island; 9 each in Iowa and Wisconsin; 8 each in Missouri and Oklahoma; 7 in Michigan; 6 in Texas; 4 each in Colorado and Washington; 3 each in Georgia, Kansas, Minnesota and Nebraska; 2 each in Maryland, North Carolina, Oregon, West Virginia and Delaware; and 1 each in Louisiana, Kentucky and Maine.

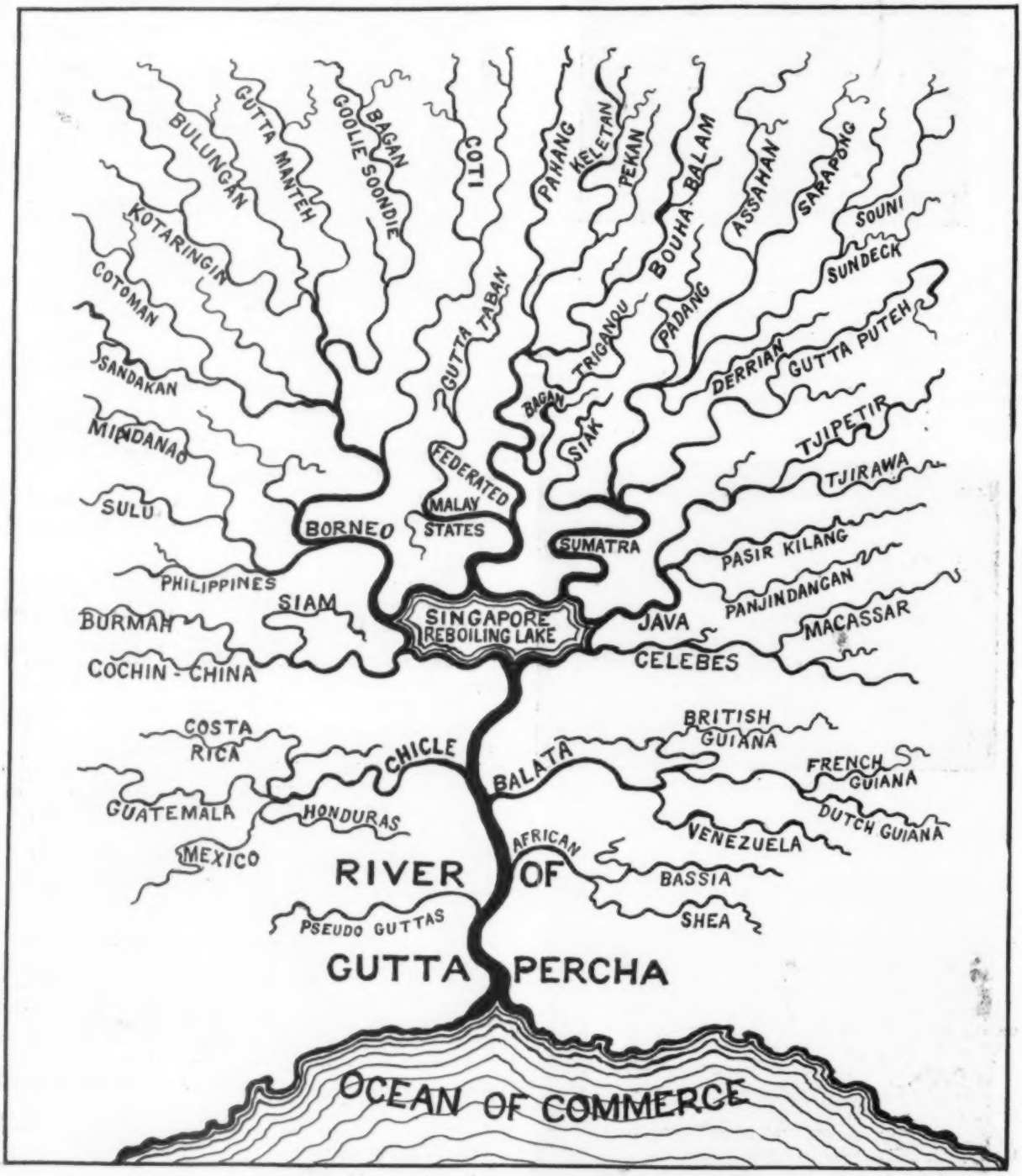
The comparative statistics for 1919 and 1914 are summarized in the following statement. The figures for 1919 are preliminary and subject to such changes and corrections as may become necessary upon further examination of the original reports.

		1919	1914
Number of establishments		475	342
Value of products[1]		$1,138,216,000	$300,994,000
Tires:			
Pneumatic—			
Automobile—			
Casings	Number	22,727,000	8,022,000
	Value	$485,904,000	$105,679,000
Inner tubes	Number	39,700,000	7,908,000
	Value	$199,305,000	$20,101,000
Motorcycle and bicycle—			
Casings	Number	3,422,000	
	Value	$11,892,000	$3,728,000
Inner tubes	Number	1,393,000[2]	6,906,000
	Value	2,904,000	
Solid—			
Truck	Number	1,620,000	
	Value	$43,917,000[2]	
All other	Number	6,635,000	13,736,000
	Value	$9,005,000	
Boots and shoes:			
Rubber boots	Pairs	9,208,000	4,025,000
	Value	$26,067,000	$12,648,000
Rubber shoes and overshoes	Pairs	66,195,000	57,212,000
	Value	$64,713,000	$37,858,000
Canvas shoes with rubber soles	Pairs	19,896,000	
	Value	$25,177,000	(3)
Heels (includes only those sold as such or on hand)	Pairs	126,572,000	
	Value	$14,238,000	(3)
Soles, including composition or fiber	Pairs	18,437,000	
	Value	$4,321,000	(3)
Rubberized fabrics:			
Automobile and carriages	Yards	14,429,000	
	Value	$10,697,000	(3)
All other	Yards	17,630,000	
	Value	$13,712,000	(3)
Belting	Value	$22,436,000	$7,989,000
Hose	Value	26,998,000	16,854,000
Packing	Value	7,317,000	3,508,000
Clothing	Value	10,450,000	6,799,000
Druggists' and stationers' sundries	Value	13,834,000	7,512,000
Hard rubber goods	Value	34,230,000	(3)
All other manufactures of rubber	Value	80,720,000[4]	40,133,000
Reclaimed rubber (produced and sold as such or on hand)	Pounds	121,795,000	(3)
	Value	$23,716,000	$11,135,000
All other products	Value	6,663,000	10,136,000

[1] In addition, in 1919, products to the value of $7,574,000 were reported by establishments assigned to other classifications and in 1914 to the value of $752,503.
[2] Not reported in 1914.
[3] Not segregated in 1914 (number of solid tires not shown).
[4] Includes scrap and old rubber (sold or on hand).

REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—H. C. Pearson's "Crude Rubber and Compounding Ingredients."

The River of Gutta



MILLIONS OF GALLONS OF LATEX FROM THE SAPOTADS OF ASIA AND CENTRAL AND SOUTH AMERICA GO TO MAKE UP THE 10,000,000 POUNDS OF GUTTA, BALATA AND CHICLE USED IN THE ARTS. THE CHART SHOWN ABOVE IS ILLUSTRATIVE OF THE SOURCES AND NATIVE NAMES

A Glossary of Words and Terms Used in the Rubber Industry—VI[1]

By Henry C. Pearson

GUTTA PERCHA

GUTTA PERCHA (GUM PLASTIC). The more or less resinous, plastic gum obtained from the concrete milk of many trees of the natural order *Sapotaceæ*, notably the *Palaquium gutta* and allied genera common in the Malay Peninsula, Borneo, Sumatra, the Philippines, and the Sunda Archipelago. The term is said to be derived from the Malayan "gatah," "guetah," or "gueutta," meaning a balsam, or a rubbery gum; and "pertcha," a tree, also a scrap, the native product looking like scraps of raw rubber before being manipulated in hot water for marketing. It is nearly white when pure, but is marketed as a grayish, reddish, yellowish, or most generally brownish, hard, tough, dense, inelastic, highly dielectric, almost inodorous substance; easily molded and impressible in hot water; resistant to most acids; inalterable in fresh or salt water; and oxidizing when exposed to air and light. It is a hydrocarbon mixture with a specific gravity varying from .9628 to .99923. It melts at 194 degrees F.

Few unmixed gutta perchas reach the market, most of them being mixtures. The deep color is chiefly due to the steeping of the gum with bark and wood particles in hot water. Besides resins, it contains varying amounts of dirt, water, and even air. Also called gutta.

ASSAHAN. A white, chalky, friable gutta percha from northeast Sumatra, of inferior quality, and with about 20 per cent débris. When fresh, the cakes have an odor not unlike ripe cheese.

BAGAN GOOLIE SOONDIE. A hard, wine-colored, soapy-feeling, good grade of gutta percha from Borneo, chiefly exported from Singapore. A term also applied to gutta closely resembling balata.

BALAM-MERAH, or SAMBUN. A Palembang high-grade gutta percha. Identical with gutta-merah. See Gutta-Merah. Very little reaches the market in a pure state. Reddish-gray, sometimes coppery when pure, very coherent, compact and hard. In section it shows layers. Pear-shaped in Palembang, but in various shapes on the south coast, such as cylinders, blocks and also folded sheets. Bounces on stone or wood floors, and creaks when two pieces are rubbed together, which characteristics diminish in proportion to the amount of adulteration. The mixtures are commonest in southern and eastern Borneo, the adulterants generally used being jelutong, hangkang, sawdust, etc. The nearly pure article is commonly mixed with bringin, making a valuable grade, or with sambun, also yielding a fine grade of gutta. See Bringin and Sambun.

BALATA. The gum of the bully or bullet tree (*Mimusops balata* or *globosa*) of the natural order *Sapotaceæ*, sometimes used as an adulterant of the better grades of gutta percha or as a substitute for some inferior grades. The gum is usually a reddish-gray or brown, often looks like dried skins, soapy to the touch, more flexible and ductile than East Indian gutta percha, which it resembles in the amount of resin content and in the fact that it softens readily in hot water, retaining its molded shape when cooled. Exported from Colombia, Venezuela, Panama and the Guianas. Comes as sheet and block, the former of which is the best grade. The grades are Surinam, amber, Surinam sheet, Venezuela (Ciudad Bolivar) block, Colombia block, and Panama block.

BANCA REBOILED. A low grade of mixed gutta percha from the island of Banca, east of Sumatra.

BANJERMASSIN. A producing district and point of export in south Borneo for gutta percha; a term formerly applied to an especially high grade of gutta percha, but now less expressive, the gutta now usually marketed being hard, blackish, porous-looking, and containing bark débris, etc. Used also as a name for jelutong rubber.

BANJER RED. A first-grade gutta percha from the Banjermassin district, Borneo, and the product of the *Dichopsis gutta*.

BANJER WHITE. A medium grade of gutta percha from the Banjermassin district, Borneo. Contains often 33 per cent of water and 15 per cent of dirt.

BASSIA. A gutta percha from the African tree *Bassia Parkii* and regarded by some as comparable to East Indian gutta.

BILA or RED SOONDI. A term sometimes applied to bagan. See Bagan.

BLITANG. A Palembang, Sumatra, gray-brown, fibrous gutta percha, always mixed with wood and bark, and usually compounded of the waste of balam-merah mixtures and inferior guttas. In the better grades some true balam-merah is added. It is seldom coherent or resilient. It is shipped in oblong blocks, sometimes with an outer layer of good gutta.

BLOCK BALATA. See Balata.

BOOK GUTTA. A low-grade gutta, prepared at Siak in Sumatra and exported from Singapore in sheets folded as a "book" with rounded edges. It is usually firm, tough, and somewhat elastic when clean. Sections show a closely-laminated, pinkish and white structure. Impurities include bark, clay and water. On cleaning and drying it loses 20 to 25 per cent in weight. See Gutta Siak.

BOUHÁBALAM. A white, chalky, friable, nerveless gutta from Malacca in the Malay Peninsula.

BRINGIN. Also known as suntik or sundek. A gutta percha ranking second in quality to balam-merah. See Balam-Merah. Seldom appears on the market pure, but is often mixed with balam-merah. It is usually exported to Singapore. When pure it is grayish-white, very coherent, and in section shows a compact mass without visible layers. Bounces and creaks like balam-merah. These qualities and the color are markedly affected by adulteration with inferior grades of gutta. Dujan is generally used for mixing, and its similar color and strong cohesion make detection of adulteration difficult, although expert handlers note less resilience and toughness. Admixture with hangkang or jelutong alters color, lessens resilience or bounce, and imparts a peculiar odor. Sometimes classed with waringin. See Waringin.

BULONGAN, or BULUNGAN. A first grade of gutta percha from a district of that name in eastern Borneo; a hard, nervous, blackish, knotty gum, white or violet in section, sometimes containing much débris; exudes a viscous liquid which hardens on contact with air.

BULONGAN, or BULUNGAN WHITE. A medium grade of gutta percha from the district of the same name in eastern Borneo.

CHICLE. A Central American gum containing about 17 per cent of gutta, the product of the coagulated latex of certain of the *Sapotaceæ*, chiefly the *Achras sapota*. Crude chicle comes in rectangular blocks containing bark and dirt, the shrinkage being from 30 to 50 per cent. In cleaned chicle the blocks are pulverized by machinery, the bark picked out, and the product dried and bagged, the shrinkage being about 10 per cent.

CIUDAD BOLIVAR BLOCK. See Balata.

CLEANED CHICLE. See Chicle.

COLOMBIAN BLOCK. See Balata.

COTI. A good gutta percha from eastern Borneo; netted on the surface, reddish yellow, but little bark, hard, and nervous. Compares well with bulongan.

[1] Continued from THE INDIA RUBBER WORLD, May 1, 1921, pages 561-562.

COTOMAN. A hard gutta percha, lacking nerve, from eastern Borneo; smooth surface, very white, has about 30 per cent shrinkage.

CRUDE CHICLE. See Chicle.

CRUDE GUTTA PERCHA. Gutta percha as it is received from the gatherers or reboilers.

GETAH MOENDIRIG. A brown, second-grade gutta from the province of Bantam, Java.

GOOLIE. A Malay term for the material extracted from the thin latex of inferior sorts of guttiferous trees.

GOOLIE RED SOONDIE, or SUNDI. A good grade of gutta percha exported from Serapong, Borneo.

GUM PLASTIC. From the Latin, *gummi plasticum*. An old and expressive name for gutta percha, as distinguished from gum elastic (*gummi elasticum*) or caoutchouc, and referring to its unique property of being easily softened and molded in hot water, or, more slowly, in hot air.

GUTTA. The essential element of gutta percha. A whitish, smooth, amorphous substance insoluble in ether, alcohol, or light petroleum spirit at ordinary temperatures. Softens at 114 degrees F. Assigned the formula $(C_{10}H_{16})X$. Also a Malay term for a variety of gums. A short term for gutta percha.

GUTTANE. A fourth substance (in addition to gutta, fluavile, and albane) isolated from gutta percha by Oesterle in 1892.

GUTTA BASSIA. See Bassia.

GUTTA COTIE. See Coti.

GUTTA-MERAH, or GETAH TABAN MERAH. A term applied to a reddish gutta percha of the highest grade shipped from Singapore, the balam-merah of Palembang and the sambun of Banjermassin. Also a name given by Chinese traders to mixtures of balam-merah with poor guttas.

GUTTA PENANG. A low-grade gutta percha exported from Singapore, but ranking in quality above gutta cotie. It is marketed in rolled sheets 5 or 6 inches in diameter; color, slightly pinkish, and is somewhat bark-specked.

GUTTA PERCHA FAT. A vegetable fat of a high melting point (40 degrees C.) obtained from the seeds of the gutta percha tree.

GUTTA QUALITY. A condition determined by the relative proportions of true gutta and resins in the gutta percha mass, the grades having the most gutta and the least resin ranking highest.

GUTTA SHAPES. Forms in which the gum is usually shipped: balls, square cakes, cylindrical rolls, pear and bottle-shaped masses, etc.

GUTTA RESINS. Fluavile—a transparent, yellowish resin, and albane—a white, crystalline resin, which together form from 10 to 54 per cent of the gutta percha of commerce.

GUTTA SHEA. A gum coagulate from the shea, galam, or bambouk tree, said to be the nearest approach to gutta percha among African products; also known as karite gum. Authorities differ as to its value as a gutta percha substitute.

GUTTA SIAK. See Siak.

GUTTA SUNDEK, SUNDI or SOONDIE. Also called gutta babou. A valuable gutta, fine samples of which show a bright, white, compact mass, some ivory-like; often colored with bark extract.

GUTTA SUSU. A rubber sometimes miscalled gutta percha, and often used as an adulterant of gutta percha, especially of balam-merah, to which, though not mixing intimately, it imparts some of its elasticity. Obtained from a vine in Sumatra and Borneo, and chiefly exported from Singapore.

GUTTA TABAN or TUBAN. A Malay term for the *Palaquium gutta*, which some claim is the proper name for gutta percha. A high-grade gutta exported from Selangor in the Federated Malay States.

GUTTA TEBAN SUTRA. Malay term for a high-quality, silky-feeling gutta percha. Some authorities accord it first place. Also called gutta derrian. See Gutta Taban.

HANGKANG, or JANGKANG, or JONGKANG. A gutta which in the Dutch East Indies is used for adulterating better kinds of gutta percha. Gray-white, often reddish, and dark-brown outside; hard, brittle, with little resilience, has a peculiar odor, and is often very dirty. Shipped chiefly from Banjermassin and Pontianak.

INDIAN GUTTA PERCHA. A gum long used as an adulterant of guttas in Singapore; hard, brittle when cold, but plastic in hot water. See Pala Gum.

INDRAGIRI. A high-grade gutta from the Indragiri river section in eastern Sumatra.

JANGKANG. See Hangkang.

KALIPÁYA. Native Philippine name for the *Palaquium ahernianum*, a tree yielding much of the gutta percha gathered in the islands.

KELETAN. A gutta from the northeast part of the Malay peninsula; when new—waxy, rose-colored; old—white, chalky; friable, lacks nerve.

KOATEI GUTAH MERAH. A good, reddish gutta exported from Singapore; grades average 44 and 46 per cent pure gutta.

KOTARINGIN. A fine white to brownish gutta from south Borneo.

KOU GUM. See Sicete.

LEAF GUTTA. Gutta percha extracted by solvents from leaves, chiefly the Palaquium.

LIQUID GUTTA PERCHA. A fluid obtained by dissolving gutta percha in chloroform, adding a little finely-powdered carbonate of lead and, after the insoluble matter has settled, decanting the clear liquid.

MACASSAR. A district in southern Celebes producing much gutta percha. A term formerly applied to very high-grade gutta percha, but now referring mostly to various sorts from Banjermassin—kotaringin, coti, bolungan, and sandekan.

MADAR GUTTA. A pseudo-gutta from the sun-dried milk of the *Callotropis procera*; habitat, deserts of Central India, Rajputana, and Sind.

MAJANG, or MAYANG. A Malay word for the gutta percha tree.

MARAGULAI. A very hard gutta, grayish and sometimes very white.

MAZER WOOD. An ancient name for gutta percha.

MIXED WHITE. A medium grade of so-called white gutta percha from Borneo.

NIGER GUTTA. An African gutta percha, also known as bassia. See Bassia.

NJATOEH. A very hard gutta, but sensitive to light, from Banjerang, Java.

PADANG. A fair grade of gutta from Padang on the west coast of Sumatra; yellowish-red, specky, hard, nervous, has about 40 per cent débris.

PADANG REBOILED. A low grade of mixed gutta from Padang.

PAHANG. The choicest grade of gutta percha, taking its name from the state of Pahang in the Malay peninsula. Usually has few impurities and is exceptionally rich in true gutta; yellowish white, rarely reddish, and sometimes faintly green.

PAHANG WHITE. A white, chalky, friable gutta from Pahang; soft, nervous, and with about 40 per cent débris.

PALA GUM. See Indian gutta percha.

PANAMA BLOCK. See Balata.

PANJINDANGAN. A medium grade Java gutta.

PASIR KILANG. A Javanese grade of gutta.

PEKAN. A slightly hard, nervous gutta, plum brown, from Pehang.

PENANG. See Gutta Penang.

PERAK. A gutta of good quality produced at Perak. See Njatoeh.

PUAN, or DUJAN. A gutta like balam-merah. See Balam-Merah.

PUTIH, or PUTEH. A Malay term under which several vari-

eties of gutta are exported. In parts of south and east Borneo it indicates dujan or an admixture of dujan, but in Palembang it refers to various mixtures of suntik with puan, or, roughly, to good, whitish, and often spongy gutta blends; a Sumatra variety, white, chalky, friable, and nerveless.

RAW GUTTA PERCHA. See Crude Gutta Percha.

REBOILED. A term applied to an operation performed by Chinese traders who buy odd lots, soften them with hot water, and make them into a fairly homogeneous mixture.

RECOVERED GUTTA. Gutta percha reclaimed from waste, chiefly cable strippings.

RED MACASSAR. See Macassar.

RESINS OF GUTTA PERCHA. Fluavile and albane. See Gutta Resins.

RESISTANCE. An electrical test applied to gutta perchas to determine insulation value. The white guttas show especially high resistance, but they are seldom used alone as dielectrics.

SAMBUN. See Balam-merah Gutta.

SANDAKAN. A very pure gutta percha, bright yellow or yellowish-white, exported from Sandakan in northeast Borneo.

SAPOTACEÆ. A natural order of trees, many genera of which yield gutta percha.

SARAWAK. Name of a fine grade of gutta percha produced in the Sarawak territory in northwest Borneo; deep-brown, nervous, with a spongy, veined surface.

SARAWAK, MIXED. A low mixed grade of reddish gutta percha from Sarawak, and often much speckled with bark.

SERAPONG, or SARAPONG, GOOLIE SOONDIE. A good grade of gutta percha from Serapong, Borneo; the cleanest of the raw guttas, containing usually but 3½ per cent of dirt, but having over 25 per cent of water. This term is often applied to several mixtures.

SHEET BALATA. See Balata.

SIAK. An east Sumatra gutta percha, reddish yellow, about 50 per cent bark débris, fairly hard, but little nerve. See Book Gutta.

SICTE KOU GUM. Chicle extracted from the fruit of the sapota tree. See Chicle.

SOONDIE, or SUNDI. A Malay term derived from gutta-sundek.

SOUNI. A Sumatra gutta percha of varying mixture and quality.

SUMATRA SORTS. A term formerly applied to various medium guttas.

SUNTIK, SUNDEK, or BRINGIN. See Gutta Sundek.

SURINAM SHEET AND AMBER. An old name given to Balata from Dutch Guiana. See Balata.

SUSU-POKO. Malay for English milk tree. A gum produced in the Malay peninsula used as a gutta percha substitute after treatment with sulphur chloride.

TALOTALO GUM. A hard, gutta-like, inelastic gum from the Fiji Islands. Also called "Kau Drega."

TEBAN, or TABAN. A Malay term for the gutta percha tree and often used in names of gutta percha sorts.

TENSILE STRENGTH. The chief mechanical property of gutta percha and proportioned to the amount of resin in the gum.

TJIPETIR. A Javanese gutta.

TJIRAWA. A gutta variety from Java.

TRIGANOU, or TRIGANO. A gutta from the northeast of the Malay peninsula; white, chalky, friable, with about 31 per cent of adulterant.

TU CHUNG RUBBER. A gum, regarded as true gutta percha, from the chung tree (*Eucommia ulmoides*), that is indigenous to China.

VENEZUELA BLOCK. See Balata.

Progress of the Malayan Rubber Restriction Movement[1]

By Richard Hoadley Tingley

THROUGH the courtesy of a well-known rubber importer, I am able to present some of the facts in relation to the rubber restriction movement in the Malayan peninsula—its inception, history and results, both present and prospective.

ATTEMPTS AT COMPULSORY RESTRICTION

The Planters' Association of Malaya recognized that the present 25 per cent voluntary restriction scheme is in every way unsatisfactory and by no means sufficient to bring down the output to an economic level. This body, which consists of the managers and planters of the rubber estates of the Federated Malay States and the Straits Settlements, approached the Government of the Federated Malay States on the subject, and found it sympathetic. The Planters' Association was therefore requested to draw up a bill for approval. This scheme provided for—

A 50 per cent compulsory restriction on the output of all rubber estates in the Federated Malay States and the Straits Settlements on the actual crop of 1920. The present 25 per cent restriction is on the estimated crop of 1921.

Estates unable to carry on owing to lack of funds may apply to the Government for financial assistance. The Government may give such assistance up to a maximum of $3 an acre per month (Straits dollars).

The Malayan Government approved these proposals, but before any legislation of this kind could be passed, the authority of the Secretary of State for the Colonies in London was required. The proposals were therefore cabled to him. The Secretary, in turn, consulted the Rubber Growers' Association of London which represents all the big rubber companies whose registered offices are in London. It is calculated that they control approximately 1,200,000 acres of the planted acreage of the Middle East, and incidentally the members of the Planter's Association of Malaya are almost all managers of estates under the control of London directors, who, in turn, are members of the Rubber Growers' Association. Precisely what happened in London is not quite clear, but the outcome has been that the Rubber Growers' Association declined to agree to any plan of compulsory restriction.

Many influential men in the Malay States agree that a compulsory scheme is the only one which will meet the case, but almost without exception these same men are convinced that no compulsory scheme will ever be sanctioned by the Rubber Growers' Association. It seems to be the intention of that body to seize this opportunity of allowing the weaker and badly financed estates to pay the penalty and to pass out of existence (or alternatively, to allow the wealthier estates to buy them up at a low figure), and, as a result, leave the bigger and more stable estates in a strong position for the future. In other words, they are strongly opposed to government control and prefer to let the ordinary rules of trade work out logically—the strong surviving, the weak going to the wall.

"During my visit to Kuala Lumpur," says the investigator in his dispatches, "a conference was held between the Government and the Planters' Association of Malaya. There had been a strong difference of opinion on the question of including the small

[1] From private reports recently received by F. R. Henderson & Co., New York. N. Y., from its eastern correspondent, Henderson Brothers, Limited, Singapore, who sent a special representative into the field to ascertain conditions at first hand.

estates under 100 acres in the scheme of compulsory reduction. The Government contended that such a restriction would spell certain death to most of these. It must be borne in mind that there are thousands of small native owners in the Malay Peninsula, with allotments of from 5 to 50 acres who tap their own trees and live on the proceeds. These estates aggregate almost 500,000 acres, so I am informed, although I have not been able to verify these figures. The Planters' Association definitely declined to allow the exclusion of the small estates from the plan, and, as no agreement could be reached, the meeting broke up. It is important to note that no official reports of any kind were issued here regarding the scheme. Innumerable articles have appeared in all the local Malayan papers, giving their own views and their own forecasts of the future. Most of these, however, are absolutely contradictory and very misleading.

"My own personal belief, which is that of a great majority of the planters, is that the decision rests with the Rubber Growers' Association in London, and that, as they represent for the most part the wealthy and well-financed estates, they will prefer to see the poorer and weaker estates go out of cultivation rather than consent to compulsory restriction under government control. The Dutch East Indies, Borneo, Ceylon and South India have not at present any similar proposals, and unless they also agree to government control, the Federated Malay States would suffer much more severely than other planting countries."

One of the principal sources of revenue of the Government of the Federated Malay States is the export duty on rubber which ceases when the price falls below 50 cents (Straits) per pound (about 1*s.* 2*d.*, or approximately 23 American cents). At present prices, therefore, the Government is losing a large part of its income, and it is to the direct advantage of the Government that the price of rubber should advance to higher levels.

THE TWENTY-FIVE PER CENT VOLUNTARY RESTRICTION

This scheme, which has been in force since November, 1920, has produced very extraordinary results. In the first place, the restriction is not on the crop of 1920, but upon the estimated crop of 1921. The analysis of the outcome up to the present time shows very conflicting results. Many estates have carried out the plan according to agreement. Others have reduced as much as 40 or 50 per cent. Some have considerably increased their crops, while, on the contrary, some have ceased tapping altogether.

Native estates and those owned locally are not included in the scheme, as they are not under the control of the Rubber Growers' Association which is responsible for its inception. A good many of the locally-owned European companies registered in the East are restricting—either by adopting alternate-day tapping or resting less profitable areas. Some few have closed altogether, owing to lack of funds. The net result seems to be that the native and locally-owned estates of Malaya are now producing approximately 25 per cent less than a year ago.

It has been almost impossible to arrive at any reliable data regarding the Chinese estates, but a very large portion of their crop is, as is well known, of a low grade. At present, these grades are almost unsalable and are probably being stored. "I have learned from Chinese sources," continues the report, "that the larger estates, that is, estates over 50 acres, are producing their rubber at a very cheap rate—18 to 20 cents per pound—or between 5*d.* and 6*d.* Singapore (approximately 8 to 10 cents United States currency). The very small estates—5 to 50 acres—are finding it difficult to produce below the selling price and many of them are closed down. It is certain, therefore, that they must, in the aggregate, show a big reduction on last year—probably 25 to 35 per cent would be a fair estimate."

On the European Malayan estates the crops show great variation, some are greater, some less than last year, but on the total figures the net result has been a decrease of about 12 per cent. This figure is arrived at by a direct comparison of the crop of December, 1919, and December, 1920. As these estates account for the great bulk of the rubber produced in Malaya, it is now estimated that the total reduction on all estates is about 15 per cent.

The tendency is for the crops to show greater reductions as time goes on. There is no doubt that a great many of the smaller and poorer estates are already greatly restricted and in many cases closed down, and the acreage out of bearing will tend to increase rapidly if present low prices continue. From an analysis of the entire report it is safe to estimate total crop output is now well up to the standard of 25 per cent voluntary restriction.

COST OF PRODUCTION

It is obvious that everything possible is now being done to cut down expenses. Estimates are subject to the most rigid scrutiny and everything not absolutely necessary is cut out. On the European estate no capital expense is allowed for new buildings or new machinery unless of the most urgent need. The directors tell their managers, "We have no funds to give you. If the estate is to continue, you must produce under the selling price." This is the best possible incentive to economy as the manager's job depends on his ability to cut costs to the lowest figure. The report states that one manager, when placed in this position, had actually cut his costs down to 6½*d.* f.o.b., or about 10¼ cents per pound, United States currency.

The cost of labor in 1920 was high, partly owing to the general tendency to higher living costs, and partly to scarcity of help. Rates of pay vary considerably throughout the Federated Malay States. In Jahore and Malacca they are higher than in Selangor, Perak and Negri-Sembilan. As a result of the slump many of the estates have discharged the coolies and the consequent surplus has resulted in lower wages all around. Chinese coolies who earned 60 cents a day ten months ago are now glad to get 45 cents (Straits). Many of the estates are replacing their Chinese by Tamils who are cheaper and less independent. The price of rice has fallen enormously and all commodities, as acetic acid and tapping and packing articles, show a downward tendency and are more likely to become cheaper than not.

"The average well managed estate," the report continues, "is able to produce rubber at the present time, at 38 cents, Straits (about 11*d.* per pound, 18 cents United States currency), and new estimates show further reductions. I saw several estate estimates of 30 to 32 cents (14 to 14¾ cents United States currency) for 1921, and the agents assured me that these costs could easily be realized with proper care. In the Jahore and Malacca districts the costs are a few cents higher, but there, also, well-managed estates ought to produce at about 10½*d.* (about 17 cents United States currency) per pound, f.o.b. The average cost to a London estate between the f.o.b., and the 'all in' cost, after adding in the directors' and secretarial expenses, selling charges, freight, insurance, etc., is 2¼*d.* per pound, so that the 'all in' costs of a good average estate in the Federated Malay States, for the year 1921, should not exceed one shilling per pound (about 19½ cents United States currency).

"As regards the Chinese estates, it is difficult to generalize, but it is certain that a fairly large Chinese estate can produce as cheaply as a European one. The only figures I actually possess show that the Chinese estates of 100 acres and upwards are producing as low as 6*d.* per pound, f.o.b. The smaller ones are more expensive but vary so much that it is impossible to give a firm figure. The fact that most of the very small native estates turn out 'junk' which fetches a very low price has probably accounted for many of them stopping tapping altogether.

"It is worth noting that the slump has already caused a certain amount of unemployment among both Europeans and natives. The Government has the matter in hand and is arranging to employ the surplus labor on government works, like roads and buildings. Otherwise, a large unemployed force in this country would lead to trouble of a very serious nature like gang robberies

and other crimes. A starving Chinaman is a dangerous citizen."

THE VALUE OF ESTATES

In discussing this subject, the report divides the estates into three classes:

1. These are the estates which have been opened and planted in the best way. They are clean, healthy, and furnished with permanent buildings, up-to-date factories, and will be able to carry on for years without any heavy expenditure for new buildings and capital outlay. In this group are classed all the best London estates, like Harrisons & Crosfield, Guthrie, Boustead, etc. or the Holland-American plantations in Sumatra. For various reasons the original cost of such estates varied enormously, but it may be taken as a good safe figure that to open, plant, and provide all permanent buildings, etc., and to bring a first-class estate into full bearing costs about £50 per acre. In 1919 such an estate was valued by the market value of the shares at about £150 per acre, that is, a one-pound share was quoted on the London Stock Exchange at three pounds. At the present time its market value is about £1 12*s.* 6*d.*, or £80 per acre.

2. There are a great many estates in the East which have all the properties of a rubber estate without being nearly first class. They have been badly planted, overtapped, and in most cases have poor buildings and factories. Most Chinese estates come in this group, and, from what could be learned locally, it would be possible to purchase an estate of this description at the present time for between £40 and £50 per acre. It is in this group that the biggest wastage will take place for the reason that many have no funds and cannot operate at present prices.

3. The native-owned estates which consist of simply so many rubber trees and the most primitive means of tapping and curing the rubber. These are worth practically nothing at the present time.

"On my visit to Kuala Lumpur," says the investigator, "I had a conversation with a director of a large company which possesses 5,495 acres under rubber, and is a first-class, well-managed property in every respect. He informed me that his company had just completed the purchase of 1,000 acres adjoining their estates, for £36 per acre. This rubber was well-planted and in good condition but not yet in bearing and the owners were unable to finance it until maturity. An offer of £36, cash down, closed the deal. I have no doubt that if any one was prepared to bid a reasonable price for many estates the owners would be only too glad to sell, but the figures I have given are the present values according to the market value of the shares."

STOCKS OF RUBBER

This is a subject on which it is exceedingly difficult to obtain reliable figures. In Kuala Lumpur, Ipoh, and Penang there are many estates which have large stocks on hand, but one can get nothing definite. One thing is certain, estates that did not sell rubber forward for 1921 and are able to hold on to it, are certainly doing so. Similarly, the Chinese are holding big stocks here, bought months ago, and are simply sitting on it indefinitely until they can sell at a profit. Although there is no means of proving it, the report's estimate of between 60,000 tons and 100,000 tons for the Middle East cannot be very far out. No one can do more than guess at the figure, but there is certainly a great deal of rubber in stock.

IN GENERAL

"While the big men in the planting industry," concludes the report, "fully realize the nature of the present crisis, they are by no means panic-stricken. A very great majority of the large estates are well-provided with funds and can last for a long time. It would be in their interests if the slump resulted in the disappearance of many of the smaller and poorer estates. Where convenient and possible, it might pay the big estates to buy up the smaller ones. They take the view that this is not the first slump in the history of the industry, nor is it confined to rubber alone, and that things will right themselves in time. Restriction of tapping is by no means an evil. It enables the estate to rest its trees and improves them in every way for bigger yields in the future. The results of alternate-day tapping are uncertain, but it has been proved that if one can obtain 75 per cent of rubber by alternate-day tapping, as compared with daily tapping, the cost of production is the same. The lower the selling price of rubber, the more profitable is the alternate-day tapping system, owing to saving in labor. Results so far show that alternate-day tapping will yield at least 60 per cent of daily tapping, and the probability is that this percentage will greatly increase as time goes on. Furthermore, many estates were overtapped during the boom. To rest them now will do them all the good in the world.

"I have also tried to find out how long it would take for an estate which ceased operations entirely and was allowed to grow up to weeds, to reach a state when it would be of no value. Even after a year's neglect it could be brought back to bearing with a good deal of expense. After two years' neglect it would be so overgrown as to be practically valueless. In any case, it would cost very little to keep an estate clean, even if no tapping took place, and some estates are adopting this policy where the company has surplus cash. It is always expensive tapping new areas for the first time, and it is cheaper and better in every way to leave the trees as long as possible before tapping them.

"The general position in Malaya is bad, but by no means hopeless. Although for the moment very few estates are producing rubber under the present selling prices, the result of drastic economy will tend to bring down costs very considerably and will give the estates a very necessary lesson in economy. Native and Chinese estates will suffer badly and unless matters improve, many will probably pass out of existence and become overgrown with weeds. Apart from any compulsory restriction scheme, there will be a big reduction in output this year, and I believe every month will see a still further reduction in output generally. It will depend on how soon and how much the market recovers to a profitable level whether a big acreage in the Federated Malay States will be lost for the future."

COMPRESSED CARBON BLACK

Carbon or gas black as first obtained at the factory is very bulky and only about three to four pounds are contained in the standard bag measuring 22 by 12 by 8 inches. By agitation and proper methods of packing, however, much of the contained air is expelled so that the standard package will contain 12½ pounds, net.

Carbon black, being light and fluffy, if used on ordinary rubber mills in an open room, is apt to be thrown up into the air as the rolls revolve, rendering the operating conditions insufferable. In consequence, black mixing is often conducted in a separate room on hooded mills provided with a slight suction draft so that the dust will be more or less under control. In this way the ordinary uncompressed black may be tolerated.

The desire to improve the conditions of handling carbon black in the mixing room has led manufacturers to consolidate it in compact packages. This is a slow process since the required pressure must be applied gradually, permitting the air to seep out of the bag where it is tied. In addition, the pressure at the final stage must be left on the black some time, as otherwise expansion would take place on removal of the pressure. Pressed black, as ordinarily put out at the present time, is in standard bags measuring 22 by 12 by 4 inches, or these are again compressed to measure 22 by 6 by 6 inches. This final compression shows a reduction in volume of more than half the original package.

Many rubber manufacturers find that this compressed black, while more acceptable to the workmen, is more difficult to mix than in the loose condition. This fact, together with the increased price entailed, tends to confirm continuance of the general practice of segregating the mixing of black stocks in a room apart from other rubber work.

Tire Production in the United States

STATISTICS published by the United States Department of Commerce, together with those gathered and prepared by THE INDIA RUBBER WORLD, show the development of the American rubber tire industry during and since the world war.

That its phenomenal growth is due chiefly to the enormous and steadily increasing use of the automobile for both business and pleasure is indicated by the rapidly advancing motor vehicle registration for recent years and the fact that only about 2½ per cent of the tire product is being exported. The United States consumes practically all the tires it makes.

AMERICAN MOTOR VEHICLE REGISTRATION

The total 1919 registration of 7,558,666 cars represented a gain of 23 per cent over 1918; that of 9,211,295 cars in 1920, a gain of 22 per cent over 1919. Five states—New York, Ohio, Pennsylvania, California and Illinois, named in their relative order, have about one-third of the total registration of the whole country. Their 3,107,050 motor vehicles is over 81 per cent more than the combined registration of the entire world exclusive of the United States.

Of the entire world registration of passenger cars and trucks, numbering 10,922,278, 83 per cent are in the United States. In other words, there are nearly 5½ times as many cars in operation in the United States as in all the rest of the world. It is interesting also to note that in 1914 the United States had more motor vehicles than all the rest of the world now has.

Assuming five tires per car as the average annual consumption in 1913 and three and one-half tires per car the present consumption, owing to the wider use and longer life of cord tires, the American demand for tires has grown from about 6,275,000 in 1913, to about 32,239,532 in 1920, or more than five times that of 1913. On the same basis, the 1920 tire demand for the rest of the world was only 5,988,440 tires.

AMERICAN TIRE AND TUBE PRODUCTION

During the past seven years the American tire and tube production, actual and estimated, has been as follows:

PNEUMATIC TIRE AND TUBE PRODUCTION

Year	1913	1914	1915	1916	1917	1918	1919	1920
Casings	*6,588,000	*8,983,000	*12,840,000	†18,564,957	†25,840,656	*21,000,000	*35,000,000	*43,750,000
Tubes	.....	.....	.....	†16,785,398	†23,256,752	*19,000,000	*34,500,000	*43,125,000

*Estimated. †Under 6 inches.

It will be seen that the figures for 1917, the last year prior to government curtailment of tire production, show an increase to nearly four times the output for 1913. Although production in 1918 was curtailed to about 85 per cent of the 1917 output, the 1919 production showed an increase over 1917 of 23 per cent in casings and 48 per cent in tubes. In 1920 the production of casings and tubes increased about 25 per cent. At an average of $25 per tire, the retail value of the 1920 product of casings was about $1,093,750,000, to which may be added $172,500,000 for the tube production at an average of $4 per tube, making a total of $1,266,250,000 for the pneumatic tire output of 1920.

AUTOMOBILE REGISTRATION

Year	1913	1914	1915	1916	1917	1918	1919	1920
Cars	1,254,971	1,711,339	2,445,664	3,512,996	4,983,340	6,146,617	7,558,666	9,211,295

AMERICAN CRUDE RUBBER CONSUMPTION FOR TIRES

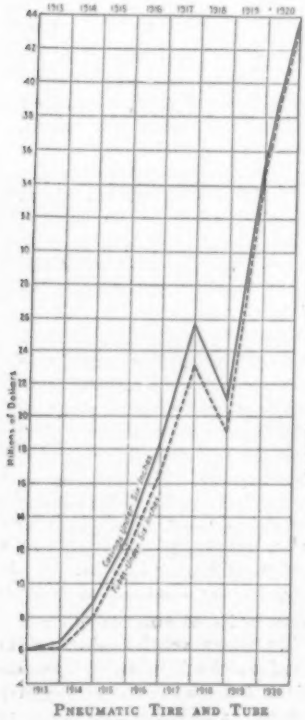
For the manufacture of the tires and tubes mentioned above the consumption of crude rubber was as follows:

	1918*	1919*	1920
Automobile and motor truck casings ..... *pounds*	150,000,000†	225,000,000†	204,852,163
Inner tubes	35,000,000†	48,000,000†	51,025,392
Solid tires	48,000,000	40,000,000	26,482,247
Other tires and sundries.....	15,000,000	12,000,000	10,075,927
Totals	248,000,000	325,000,000	292,435,729

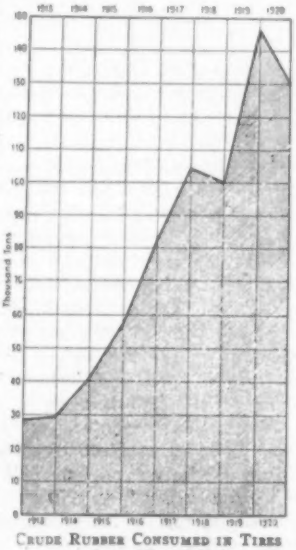
*Estimated.
†Under 6 inches.

Only the estimated total weights are available for the years 1913-1916. They are in pounds: 1913, 65,880,000; 1914, 89,830,000; 1915, 128,400,000; 1916, 185,649,570. The total 1917 consumption was 233,386,796 pounds. As compared with these figures, only 47,907,520 pounds of rubber were required to manufacture the 5,988,440 tires required to meet the 1920 world demand exclusive of the United States, assuming 8 pounds of rubber per tire.

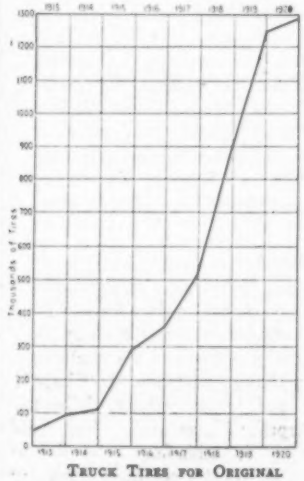
In 1920 some 51 per cent of the total india rubber im-



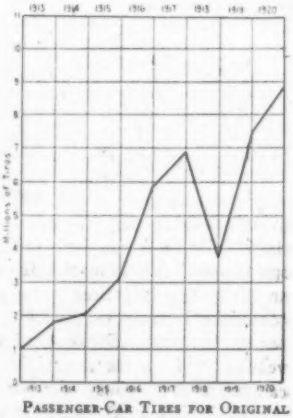
PNEUMATIC TIRE AND TUBE PRODUCTION



CRUDE RUBBER CONSUMED IN TIRES AND TUBES



TRUCK TIRES FOR ORIGINAL EQUIPMENT



PASSENGER-CAR TIRES FOR ORIGINAL EQUIPMENT

ports into the United States was used for tires and tire sundries as against 60 per cent in 1919, 75 per cent in 1917 and 58 per cent of the imports for the fiscal year 1913, indicating the greater supply of the raw material. The actual quantity of crude rubber used in 1920, however, was not quite 4½ times that for the year 1913, as against almost five times the 1913 quantity in 1919 and about 3½ times that for the year 1917.

AMERICAN TIRE DEMAND FOR ORIGINAL EQUIPMENT

Statistics of motor vehicle production in the United States indicate the increasing number of pneumatic and solid tires required annually for original equipment.

MOTOR VEHICLE PRODUCTION

Year	Passenger Cars	Motor Trucks	Totals
1913	461,500	23,500	485,000
1914	543,679	25,375	569,045
1915	818,618	74,000	892,618
1916	1,493,617	90,000	1,583,617
1917	1,740,792	128,157	1,868,947
1918	926,388	227,250	1,153,637
1919	1,657,652	316,364	1,974,016
1920	1,883,158	322,039	2,205,197

Only a cursory inspection of these figures is necessary to see how the production of passenger cars and correspondingly of pneumatic tires under six inches was curtailed by the war situation of 1918, and the production of trucks and truck tires stimulated. Truck tire production for original equipment has shown continuous growth during and since the war period. In 1918 it had increased to over 9½ times the 1913 production for this purpose and in 1920 to over 13⅓ times the 1913 production. In 1920 pneumatic tire production for the original equipment of passenger cars exceeded the previous high figure for the year 1917 by 569,464 tires, and exceeded the 1919 requirements by 902,024 tires, this being over four times the 1913 output. It is seen, therefore, that while 1,940,000 tires sufficed for new equipment in 1913, no less than 7,475,888 were required in 1917, and 8,820,788 in 1920, an increase to over 4½ times the 1913 requirements. During the past year both the greater volume of increase and the greater rate of increase have been in pneumatic tires under 6 inches, as distinguished from large pneumatic and solid tires for trucks.

As to the 1921 production of motor vehicles and tires for original equipment, estimates vary rather widely. Prophets, of course, are as fallible as those who do not venture opinions. Furthermore, the major part of all prophecies fail. However, business conditions throughout the country are such that, with an abnormal number of used cars on the market, it seems unlikely that the 1921 production of motor vehicles will exceed 75 to 80 per cent of the 1920 output, say 1,500,000 passenger cars and 250,000 trucks, the total 1,750,000 vehicles requiring 7,000,000 tires for original equipment.

TIRES IN USE IN THE UNITED STATES

Of the 9,211,295 motor vehicles registered in the United States during the calendar year 1920, some 990,000 were trucks, so that nearly 8⅓ times as many pneumatic tires under 6 inches as truck tires were in use last year, the number of each sort, exclusive of spares, being approximately 32,885,180 pneumatics under six inches and 3,960,000 truck tires. One additional tire per car would be a conservative estimate for spares, making the totals, 41,106,475 pneumatics and 4,950,000 truck tires. With 46,056,475 motor vehicle tires in use it is not surprising that some 30,000 vulcanizers are kept busy with repairs and retreading.

On the basis of 40 pounds of rubber average per car for regular equipment and one spare, a total of 368,451,800 pounds of rubber had been consumed in manufacturing the tire casings in use in the United States last year, an amount greater than the total india rubber imports of the United States for the calendar year 1918, and equal to nearly 54 per cent of the United States india rubber imports for the calendar year 1920. On the same basis, only 68,439,320 pounds of rubber had been consumed in manufacturing the tire casings in use in the entire world exclusive of the United States.

UNITED STATES TIRE EXPORTS

Export trade is becoming an increasing part of the American motor tire business, as shown by the following statistics compiled the Bureau of Foreign and Domestic Commerce.

A study of these figures reveals several facts of interest, particularly the remarkable growth of the tire exports to the entire world notably Europe, and to Oceania, Asia and Africa. The combined value of the 1920 business in the three divisions last named was nearly 50 times the value of these exports in 1913. Tire exports to Asia have increased constantly, the 1920 total being 140 times that of 1913 and 40 per cent greater than that of 1919. Exports to Oceania fell off in 1917 but the following year had nearly reached the high mark of 1916. In 1919 there was a substantial increase that continued through 1920.

North American exports were adversely affected in 1914 and 1915, but thereafter grew steadily, the 1920 business showing a large growth over 1919.

The South American trade maintained a continuous and remarkable growth from 1913 to 1920, inclusive, the value of the 1920 exports being more than 60 times that of 1913.

Exports to Africa grew steadily until 1918, when their value reached some 42 times that of 1913, but showed a falling off of about 7¼ per cent for the calendar year 1919 as compared with the fiscal year 1918. The 1920 business, however, increased to over four times the value of that in 1919.

European exports have fluctuated greatly owing to the war. In 1914 they decreased a little, but increased considerably in 1915 and in 1916 jumped to more than five times their value in 1913, after which they declined steadily, the value of the 1918 shipments being only about 74 per cent of the 1913 value. The 1919 exports, however, exceeded the banner year 1916 by more than 8 per cent, showing an increase to more than six time the 1913 value—and the 1920 business was over $18,500,000.

AUTOMOBILE TIRE EXPORTS

Exported to:	1913*	1914*	1915*	1916*	1917*	1918*	1919†	1920†
Europe	$1,977,029	$1,764,240	$2,745,450	$10,992,184	$3,480,114	$1,460,518	$11,907,480	$18,554,782
North America	1,626,155	1,254,200	1,187,632	2,184,874	3,186,265	4,474,713	5,188,317	7,193,918
South America	100,065	115,387	214,068	1,050,398	2,596,936	3,432,181	4,986,024	6,426,412
Asia	36,212	64,173	73,430	477,895	810,300	1,194,551	2,970,464	5,220,430
Oceania	185,807	279,327	702,877	2,896,401	1,832,244	2,662,422	3,177,431	3,953,506
Africa	17,952	27,940	39,813	334,475	424,342	753,286	694,943	2,550,546
Totals	$3,943,220	$3,505,267	$4,963,270	$17,936,227	$12,330,201	$13,593,420	$28,924,659	$43,899,594

*Fiscal year ended June 30. †Calendar year.

Total tire exports to all countries fell off in 1914, but gained in 1915, jumped during 1916 to about 4¼ times as much as in 1913, dropped considerably in 1917, but showed a noticeable gain in 1918 and have increased ever since. Automobile tire exports for the calendar year 1919 amounted to more than double the value for the fiscal year 1918, and for 1920 were over 50 per cent more than for 1919. It may be said, therefore, that despite the fluctuations of 1914 to 1917, inclusive, and the lower rate of increase last year, American automobile tire exports have shown a great and steady growth, the value of the foreign business in 1920 having increased to over eight times what it was in 1913.

TOTAL AMERICAN TIRE DEMAND FOR 1921

It is estimated that the 9,211,295 motor vehicles registered in the United States in 1920 will require about 32,239,532 tires annually to replace those worn out at the annual rate of 3½ tires per vehicle. To this may be added the 7,000,000 tires likely to

be required as original equipment for the 1921 production of some 1,750,000 passenger cars and trucks, making a total visible demand for 39,239,532 tires. That this total appears to be a conservative estimate is indicated by adding 22 per cent—the increase in motor car registration for the year 1920—to the estimated 1920 tire consumption amounting to 34,065,000 tires, as shown in THE INDIA RUBBER WORLD of March, 1921, page 410, which indicates a demand for 39,559,300 tires. Thus, despite the temporary sales depression of the spring and early summer, the future of the tire industry cannot be viewed with other than assurance.

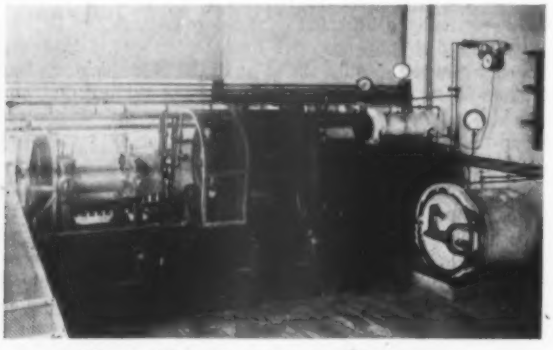
A PNEUMATIC TREEING MACHINE

This machine is a great improvement on the machines using wooden feet, as these feet are made of flexible rubber, covered by leather and supported by a wooden back or leg. The rubber feet are inflated with compressed air supplied by a small air compressor and air tank. The shoe to be ironed is placed on the tree, air admitted, and the rubber foot encased in the leather casing expands to fill uniformly the shape of the last. With the release of the air the foot collapses and the shoe is readily removed. This machine does not require a change of feet for every size of shoe to be ironed, two or three shoes being treed on one size foot.—W. J. Young Machinery Co., 416 Union street, Lynn, Massachusetts.

RUBBER ACCELERATOR SERVICE LABORATORIES

AT its Perth Amboy plant, the Roessler & Hasslacher Chemical Co. maintains what might be termed an accelerator service laboratory. A number of years ago when the use of accelerators was in its infancy, this company prepared to secure exact information as to the action of its accelerators in various stocks and under widely varying conditions. It therefore engaged the services of an experienced rubber technologist and equipped a modern rubber laboratory for this purpose.

The laboratory equipment, part of which is shown in the accompanying illustrations, was so selected that all factory conditions of vulcanization could be duplicated. With this equipment it has completed elaborate series of tests on its various accelerators in standard-type formulas in comparison with many other well-known accelerating materials, and with some not so well known. The type formulas used were so selected that the effect produced by large and small amounts of active inorganic materials could be determined. As a result of these comprehensive tests, the

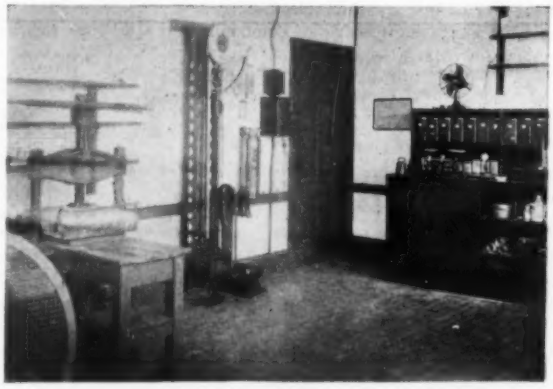


MIXING MILL, CALENDER AND VULCANIZERS

company is able to give rubber manufacturers exact information as to the proper utilization of its accelerators under widely varying conditions.

Many rubber manufacturers have availed themselves of the service offered and have sent type, or actual formulas in which it is desired to use an accelerator. When such formulas are received, varying amounts of accelerator are added and the stock is given a range of cures for each percentage to determine the optimum cure for factory operation. The usual tests, tensile, stretch, and permanent elongation, are recorded for each cure and the results are submitted to the rubber manufacturer.

During the four years of its operation this laboratory has accumulated a vast amount of accelerator information and has made practical tests for many rubber manufacturers covering stocks



COMPOUNDING BENCH, VULCANIZING PRESS AND TENSILE MACHINE

varying from those for rubber bands to those for solid truck tires, many of which have resulted in a direct benefit to the rubber manufacturers. This service is offered gratis to all present and prospective accelerator users regardless of the magnitude of their output.

INTERESTING LETTERS FROM OUR READERS

RECEIVED THE DESIRED INFORMATION

TO THE EDITOR:

DEAR SIR: We wish to thank you for your letter of May 19 and for the information contained therein. This information is just what we were anxious to get.

I have also taken steps to have this company subscribe to THE INDIA RUBBER WORLD in the very near future. I feel that you will undoubtedly be able to help us a great deal from time to time both through the periodical which you publish and by direct answer to our questions. It is very gratifying indeed to find one who is willing to give the right kind of information.

We shall look forward to receiving the sample copy which you have sent to us. INQUIRER.

This letter is published to call our readers' attention to the opportunity afforded by our Information Department for reliable rubber information.—THE EDITOR.

INTERESTED IN SELECTING WORKMEN BY PSYCHIATRY

TO THE EDITOR:

DEAR SIR: Is it possible to get full details as to method employed, questions, etc., by Lieutenant A. W. Stearns, M. D., in selecting workmen by psychiatry as mentioned in your issue of May 1, 1921, page 554?

Such information would be of real value to me.

Alameda, California. A READER.

Lieutenant A. W. Stearns is a resident of Billerica, Massachusetts, and I am sure would be very glad to be put in touch with you.—THE EDITOR.

AMERICAN TIRE TRADE IN BRAZIL

Among exports from the United States to Brazil, during 1920, may be mentioned tires, which in that year amounted to $1,965,201 as compared with $1,018,055 the year before. This is an increase of about 93 per cent.

Repairing Rubber Gloves and Mittens—V[1]

A New and Valuable Line for Repairmen

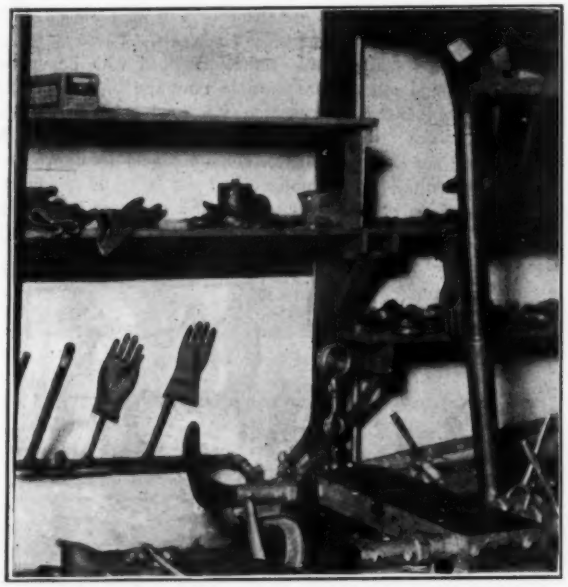
Household Gloves—Practical Suggestions—Repairing Heavy Gloves—Cement-Workers' Gloves and Methods of Repair—Electric Vulcanizer for Rubber-Glove Repair—X-Ray Gloves—Tanners' Gloves—Driving Gloves—Acid Gloves—Mercury Gloves—Cyanide Gloves—Sprayers' Gloves—Electricians' Gloves—Testing Linemen's Rubber Gloves—Rubber Mittens—Acid-Workers' Mittens—Rubber Finger Cots—Rubber Patches for Leather Gloves

HOUSEHOLD GLOVES

LITTLE or no effort appears to be made to repair efficiently the considerable number of medium-weight dipped seamless rubber gloves worn by housekeepers, tanners, dyers, photographers, gardeners, embalmers, chemists, and others. "Household gloves," as the type is known, are made from a wide variety of gums, and the colors range from white, gray, tan, red, and brown to black. For women they range in size from 6 to 9 and for men from 9 to 12, inclusive, in full and half-sizes. They are generally snug-fitting, have tapering fingers, and, while a few styles have gauntlets, most household gloves are short with a wide wrist. For special purposes some are made with a high gloss, and one variety in gray is particularly soft and pliable. Long dipped gloves (bleaching gloves) of pure gum are often used by women to cover the hand and forearm after a preparation has been applied for whitening the skin. Such gloves come in sizes of from 6 to 10, inclusive. They are repaired in the same manner as surgeons' gloves, with thin rubber and cement, and cold-cured.

PRACTICAL SUGGESTIONS

A point to remember in getting ready for repairs is that most gloves have been thoroughly coated with French talc. This



GLOVE REPAIR UNIT IN A RUBBER SHOE REPAIR SHOP

should be removed thoroughly, or the patch will not stick. It is also well to recall that gloves from hospitals may not have been deodorized or disinfected. It would therefore be well before handling these gloves at all to dip them into the formaldehyde solution that is mentioned in the previous article. Of course, after dipping they should be thoroughly dried before the patch is attempted. It is an excellent plan for a man doing small work, such as glove repairing, to get in touch with manufacturers of rubber stamps. They do a great variety of vulcanizing, make their own small molds and as a rule can give much information that is of value.

In order to get a good surface on the ends of fingers, some repairers have metal thimbles cast, finished and set into a hot plate.

MENDED WITH COTS FINGERS REFACED VULCANIZED PATCHES
THREE TYPES OF GLOVE REPAIR

The ends of the fingers can then be set down into these cavities and, with the form inside, the cure is rapidly effected. For fine gloves, the apparatus used in some of the hospitals might be of value. They use the electrical immersion heater, or rather an adaptation of it, such as is used in heating a glass of water. It is indeed quite like the electric curling iron. This will cure a patch at the end of a finger very well. If one is doing a large business, however, it is not practical. Some repairers use a large bulb with a fine nozzle on the end and draw in hot air from a gas-jet to dry a small patch just as a dentist uses his small hot-air bulb for drying out a tooth cavity.

REPAIRING HEAVY GLOVES

While all types of rubber gloves are repaired in some way, those on which the most durable and efficient mending is usually done are the heavy hand coverings of which cement-workers' gloves are a general type, and in which class might be included the gloves largely worn by tanners, dyers, glass-cutters, and acid, mercury, and cyanide workers. Primarily, the incentive to repair is the comparatively high cost of such gloves. Then, too, on account of the stocky character and rich compound of which they are made, such gloves are favorite subjects for vulcanizers who can readily affix on them patches that give good service.

The heavier gloves and mittens are used as a rule in industries where the workers' hands are exposed to destructive acids or alkalies, or where there is abrasive material that tears the hands. Where only wear is to be contended with, almost any repair stock of good quality will answer. For the best work the repair should be vulcanized into place. In many cases, however, self-curing stocks will accomplish the purpose very well. Where the worker uses gloves or mittens that come in contact with acids, care should be taken to have a repair stock in which there is very little, if any, whiting or any substance that is readily attacked by acids. Where alkali is to be encountered, the man who supplies the repair stock should be notified that patching material containing substitutes cannot be used.

CEMENT-WORKERS' GLOVES

Cement-workers' gloves are made from sheets of heavy rubber compound with seams reinforced and cemented so as to with-

[1]Copyrighted by Henry C. Pearson. Continued from THE INDIA RUBBER WORLD, June 1, 1921, pages 647-648.

stand the roughest usage. They are usually of red or black rubber, are from 9 to 11 inches long, cloth-lined, and are effective in protecting the hands of cement and mortar workmen from the corrosive alkali in moistened calcined clay and limestone. So essential are rubber gloves regarded by cement workers, that gangs laboring on concrete jobs have often struck rather than work without some such protection for their hands. They are today in general use by men spreading and finishing cement on roads, bridges, mill dams, factories and nearly all large concrete jobs.

Road and building construction companies buy cement-workers' gloves in large lots and they often sustain severe losses through misuse of the gloves, or because means of repairing them are not often convenient. The gloves are usually scrapped as soon as the cement liquid begins to seep through the cracks and fissures. Yet up-to-date repair men know that there is no reason why cement-workers' gloves should be cast aside when the breaks in them are comparatively small. They can easily be put in good condition—if not too far gone—by either of two processes which have proved practicable.

METHODS OF REPAIR

One efficient method of repairing heavy gloves of the cement-workers' type is that of vulcanizing on a piece of repair stock by using short steel tubes with the ends rounded and attached to a large steam pipe. Such tubes are made with varying diameters to fit several sizes of fingers. The rent or a worn spot in a glove is first buffed clean. A patch of 1/32-inch pure gum stock of suitable size is cemented on and the hot tube taped to protect the glove finger which is slipped over it. The patched finger is also taped to give pressure for vulcanizing, and the patch is then allowed to cure for five minutes. A second patch of similar gum stock is next applied, again taped for pressure, and eight minutes allowed for curing. The repaired glove is then rinsed in cold water and finished.

By another method, equally effective, the patch is placed inside, instead of outside the glove finger, or the palm, or back, and when the job is finished, little else is noticed on the exterior of the glove other than a dark spot corresponding in size to the rent or worn place. By this process the curing is done on an ordinary steam-heated tube-vulcanizing plate equipped with screw, spring, or weighted clamps. The glove is first turned inside out and the repair spot is then buffed on an emery wheel to clean the edges of the cut. A further buffing is given with a wire brush, widening the abraded surface and producing a more or less feathered edge around the cut. A piece of 1/32-inch quick-curing (5 minutes) tube repair gum is cut to little more than fit the buffed place which is given a coat of cement.

The patch is applied after the cement is thoroughly dry. Before being placed on the hot-plate, a piece of 1/16-inch felt is laid on top of the patch to prevent bruising the rubber, and over this a small block of wood is placed, care being taken that the block does not overlap the seam at either side of the finger. The repair job is then put on the hot-plate and the clamp applied to give the desired pressure. A temperature of 298 degrees (50 pounds pressure) is preferred, as at higher temperatures the rubber is often over-cured. Practically no finishing is required on the repaired glove.

ELECTRIC VULCANIZER FOR RUBBER-GLOVE REPAIR

A portable vulcanizer for repairing the finger tips of rubber gloves utilizes an electrically-heated platen. This British invention is an oblong, low-set device with the platen set across the center, and on the platen rest the forward ends of fourteen hinged or pivoted wooden finger-trees, seven being placed at either side, the part lying on the platen being flattened. When the torn glove finger is stretched over a tree the rubber repair stock is suitably applied and the covered tree is clamped to the platen until the cure has been effected. A thermometer on the platen indicates the degree of heat. The trees not needed can be thrown back out of the way, or all can be used together in the repair of several gloves with the same heat.

X-RAY GLOVES

Rubber figures as an important factor in X-ray and radium laboratories. Heavily compounded with lead, which is opaque to the highly penetrating radiation from the Crookes-Roentgen tubes as well as that of radium, rubber enters into the X-ray protective cloth from which masks and aprons are made. The latter are reported not only to save operators from more or less harmful skin irritation, but to give long wear. Two kinds of gloves are used, both made of rubber compounded with lead, one of light weight used for handling patients, palpation, etc., and the other very heavy and used while manipulating apparatus in large-scale radiography. Of the latter little complaint is heard, but of the lighter gloves, retailing at $15 a pair in most cases, it is said that with only ordinary use they often give out in a month or two. Splitting between the fingers and quickly wearing at the tips seem to be the common troubles. It is believed that X-rays do not exert any harmful effect on the gloves, and they are seldom touched by injurious chemicals.

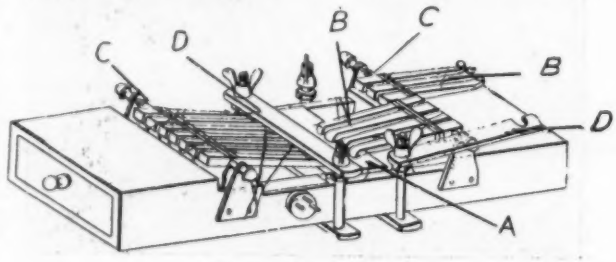
The weightier gloves, probably the heaviest gloves made, are worn when extensive radiography is done, as of the chest, abdomen, etc., and where exposure is considerable and long continued. The heavy gloves are usually 12 inches long with a cuff to protect the wrist. In the event of repairing either type of glove, the repairman would find it necessary to procure for patches, stock of the same kind used in manufacturing X-ray gloves, namely, lead-compounded, and the method of curing on patches would be similar to that employed in repairing cement-workers' gloves.

TANNERS' GLOVES

Rubber gloves for tanners are made of a stout material compounded to resist the action of most chemicals. There is an increasing demand for the gloves which are lined with heavy net as they are found much more durable than the unlined. Such gloves afford an excellent protection for the hands, wrists, and forearms of workers handling lime sulphite and caustic soda solutions used for dehairing hides, sulphuric acid solutions used for "pickling" pelts prior to tanning, and the powerful astringent solutions of oak-bark, chrome-salts, or quebracho used in tanning.

DRIVING GLOVES

Rubber gloves for driving are of fairly strong compound, and come in black, white, gray, and tan, in light, medium, and heavy



ELECTRIC VULCANIZER

A—VULCANIZING PLATEN; *B*—FINGER TREES; *C*—FINGER RODS; *D*—CLAMPS.

weights for men and women, and in sizes from 13 to 15, inclusive, and short or with 5-inch gauntlets, lined with either net, wool or fleece. Mending often can be done by curing patches on the outside by means of the hot-pipe apparatus, slightly modifying the process first mentioned for the repair of cement-workers' gloves.

ACID GLOVES

Gloves for acid-workers are made from a heavy acid-resisting black compound and are often lined with heavy net to insure

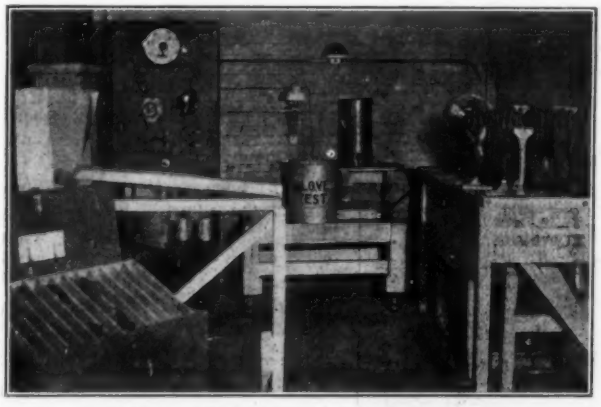
longer service. They are sold in 9 to 15-inch lengths and protect the hands, wrists, and forearms of the workers using solutions of acids and metallic salts and strong, alkaline cleansing fluids in plating, galvanizing, and other metallic and chemical operations.

MERCURY GLOVES

Gloves for mercury-workers are made in standard sizes of from 9 to 15-inch lengths of a special compound to resist the action of mercury in a liquid or gaseous state. They are used largely by smelters to protect their hands, wrists, and forearms from absorption into the system of minute quantities of the poisonous metal, which is vaporized from cinnabar and other ores by roasting. Formerly, heavy buckskin gloves were used affording poor protection to the workers. Rubber mercury gloves are also used by workers in the amalgamation process of extracting gold and silver from ores, the mercury, or quicksilver being used first to unite with the precious metals in the powdered ore and, after the excess mercury is pressed out, the remainder being volatilized with heat. Mercury-workers' rubber gloves are also much used by makers of thermometers, barometers, mercury-vacuum pumps, and other scientific instruments.

CYANIDE GLOVES

Gloves for cyanide-workers are made in black or white, usually net-lined for hard usage. The sizes range from 9 to 15 inches. The stock is heavy and specially compounded to withstand the "burning" action of strong caustic solutions used in metallurgical operations. The gloves are used to protect the hands, wrists, and



TESTING ELECTRICIANS' RUBBER GLOVES

forearms of mine-workers conducting the cyanide treatment of gold and silver ores, in which cyanide of potassium in solution is the active agent in dissolving and recovering the metals when crushing and mercury amalgamation cannot extract the greater part of the gold and silver content of the ores. These gloves are also used as a safeguard by workers in the supplemental treatment of ore tailings with sulphuric and hydrocyanic acid solutions. Cyanide gloves are also used in photography, electro-metallurgy, in the laboratory and in gold extraction.

SPRAYERS' GLOVES

Gloves of the same kind as those used by cyanide-workers are now much used by orchardists in spraying trees with liquid hydrocyanic-acid gas, dilute carbolic acid, crude sulphuric acid, and cyanide of potassium solution, lime and sulphur, Bordeaux mixture, and other germicides, fumicides, and insecticides.

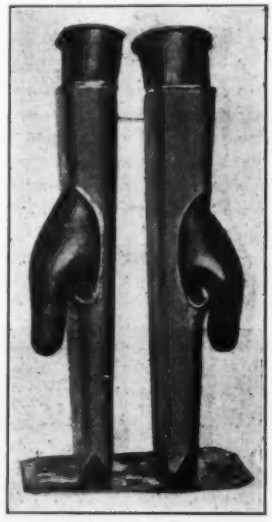
ELECTRICIANS' GLOVES

Linemen and others employed in electrical industries use heavy gloves made of pure gum, or a rubber compound that is nearly perfect as an insulator. The lighter-weight gloves are usually tested for non-conductivity up to 4,000 volts, and the gloves used on high-tension circuits are much heavier and are tested to withstand 10,000 volts. These gloves come in black, white, and maroon, in sizes from 9 to 11, short, medium, and long, some with palms and fingers reinforced. They usually give way first across the palms, due to repeated pulling on heavy wires. The method of repair is practically the same as that used in mending cement-workers' rubber gloves; and if a careful job is done, the gloves can be made quite as safe and serviceable as new ones.

Nevertheless in repairing linemen's gloves, great care should be taken, as stocks that resist electricity are an absolute necessity. If a repair man will insist on lead stock containing litharge or white lead—not any metallic substance that is a conductor of electricity—and a high quality of cement, he will be pretty safe and can do excellent work. He should be careful of red stocks, for example, as they may contain oxide of iron. At the same time, the repair man should not guarantee any such work and should insist that his repairs be tested, just as new electricians' gloves are tested.

TESTING LINEMEN'S RUBBER GLOVES

In repairing electric linemen's gloves repairmen should bear in mind that the material used in mending must be fully as good as in the glove itself and that special care should be exercised to obtain a uniform cure. Linemen's gloves above all things must be non-conductors of electricity. All rubber gloves are good insulators, but a lineman's glove must not only be of pure compound, .038 to .040-inch-thick but must also have a guaranteed dielectic strength of 10,000 volts. Each glove is tested for such resistance when bought, and later tested periodically to insure the safety of the wearers.



COPPER GLOVE HOLDERS

The method of testing linemen's gloves in America is simple but efficient. The glove is placed in a copper case open at top and bottom, and with an opening also at one side through which the thumb projects. The glove is then nearly filled with water. The holder and glove are next immersed in an iron bucket filled with water to within an inch of the top of the glove holder. An electrode connected with a high-tension current is placed within the water-filled glove, and the iron bucket is also put in the electric circuit. The tests include voltages ranging from one and one-quarter times the power strength of the lines on which the men ordinarily work, to the maximum of 10 milliamperes at 10,000 volts. If a glove fails to offer the proper resistance to the current it is rejected as defective.

In French tests on heavy electrical gloves the latter are sometimes filled with mercury and then immersed in a mercury-filled vessel, the resistance being measured between the mercury in the two containers. Another test is to place each glove filled with sand in a sand-filled vessel, the sand being made a conductor with a saturated solution of ammonium hydrochloride; and making voltage tests as with water or mercury.

RUBBER MITTENS

Mittens of pure gum, red, white and black, plain, or with a forefinger as well as a thumb, are used in many of the trades. Most mittens are of heavy stock and often reenforced on the thumbs and palms where wear is greatest. Mittens usually come in a single standard size, are short and long, and in three weights.

To protect the rubber surface, one style of rubber mitten has a binding to which cloth or other fabric may be cemented and sewed on whichever side the wear is most likely to occur. Some rubber mittens have net, wool and fleece lining, especially those worn by motormen and tanners, and may be worn on either hand.

Mittens may be repaired by curing on patches in much the same manner as indicated for heavy rubber gloves. In patching the palm of mittens, a flat, hollow spatula is excellent, and allows the repaired part to be firmly pressed on the hot-plate while the upper part is kept cool.

TANNERS' MITTENS

Net-lined rubber mittens are largely used by tanners in sizes from 9 to 11, and are made of a compound similar to that used in tanners' rubber gloves. For special work the mittens are made so that the wearer may use not only the thumb, but also the first and middle fingers, and they are reenforced between thumb and index finger.

ACID WORKERS' MITTENS

Acid-workers handling extra large articles often prefer to use mittens. These are made of the same material as the acid-workers' rubber gloves, are usually net-lined for rough wear, and come in sizes from 9 to 11.

RUBBER FINGER COTS

A cheap substitute for rubber gloves, and an article often preferable by reason of convenience, is the rubber finger cot or tip, as well as thumb cot. They are made in a wide variety of sizes for men and women, and the material ranges from the finest Pará tissues used by surgeons for minor operations to the light, medium, and heavy compounds used in cots worn by masons, bricklayers, oystermen, printers, photographers, and others. The fine tissue cots are usually rolled up when sold, and the heavier, or molded ones are delivered in nests of three or four, set one within another. The heavier cots are often well-reenforced at the closed end, leaving the lower part of lighter, more elastic material, so as to better grip the finger.

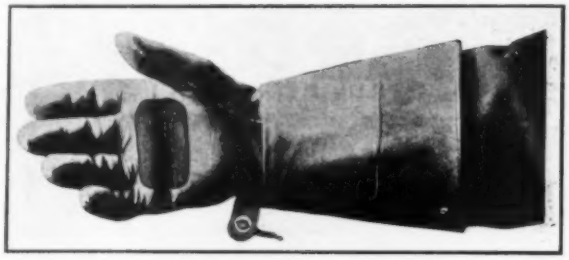
EQUIPMENT FOR TESTING LINEMEN'S RUBBER GLOVES

Reinforced rubber finger and thumb cots are also used by mirror-makers handling mercury and tin amalgam, as well as the substitute for the latter, nitrate of silver, now much used for coating looking-glasses. Finger cots obviate the necessity of frequent use of the irritant cyanide of potassium solution for removing the silver nitrate stains from the fingers.

Repairmen working on heavy gloves can often utilize a finger cot to take the place of part or all of a torn finger. In order to cure on such a patch, the hot-tube, with a little tapering, is necessary. A repairman with a little pains can often, by such means, practically make a new glove out of even the most dilapidated specimen.

RUBBER PATCHES FOR LEATHER GLOVES

A good opportunity for the rubber repairman lies in repairing leather gloves. A great many electric linemen who wear plain or rubberized leather gloves, over or without rubber gloves, have to discard the leather ones as soon as the slightest break appears,



LEATHER GLOVE REPAIR

which usually occurs on the palm. Few leather repairmen care to mend such gloves as they cannot make a neat and satisfactory job. Using suitable cement and repair stock, or self-vulcanizing material, a rubber repairman can patch such broken leather gloves neatly and substantially.

RUBBER BATH MATS AND MATTING

Non-slip matting and rubber mats, usually of white, but their attractiveness being enhanced by variegated colors, are becoming popular for use in the bath, in place of linoleum for passages and around the edges of public baths. Each bath mat is supplied with eight red molded suckers fixed four on each side, to hold the mat in position when placed. The sizes are 38 by 12, 36 by 12, 36 by 10 and 34 by 10, with a thickness of ⅛-inch, in either solid or punched styles. The punched style is more popular.

Some factories buy the sheeting in rolls already punched, others buy the unpunched rubber sheeting, and calender the rubber onto cotton duck, such as is used for belting. If the material is not shrunk at the time of calendering, it will contract during the cure, and this must be allowed for. The duck is then removed from the cool material and punched tin or paper patterns of the correct size and shape are laid on the rubber and dusted with chalk or chalk and zinc oxide mixed. In the majority of cases holes are hand-punched, though there are machines available for this purpose. Holes are punched in sizes from ¼-inch to ¾-inch, with a solid edge around the mat from one to one and one-half inches wide, to prevent tearing. The ends of the mat are rounded off before vulcanizing, to prevent unnecessary waste, and the mat is then press-cured in the usual manner.—*The India-Rubber Journal*, London.

THE OBITUARY RECORD

A PIONEER TIRE MANUFACTURER

FRED W. MORGAN, founder of the firm of Morgan & Wright, bicycle and later motor tire manufacturers, Detroit, Michigan, died of angina pectoris, aged 67, at his home in Chicago, Illinois, May 27, 1921.

FRED W. MORGAN

Mr. Morgan was born in Kiantone, New York, March 20, 1854, and received his education at the Jamestown High School. He went to work for the Akron Rubber Works, Akron, Ohio, at the age of sixteen, and was in every sense a self-made man.

One of the pioneer business men of Chicago, Illinois, he went to that city in 1876 and built up the Chicago Rubber Works, the business growing from a small, two-story building to what was at one time the largest tire plant in the world—Morgan & Wright, Detroit, Michigan. In this business, of which he was senior partner and later president, his partner, Mr. Wright, was his father-in-law. The double-tube bicycle tire, brought out by this firm, and for which it was chiefly known, earned a fortune.

In the early days Mr. Morgan was a pioneer in the mixing of rubber. At first his experiments were conducted at home in the kitchen sink, but he soon became an expert rubber compounder and, although he retired from active business about fifteen years ago, was still experimenting with rubber compounds up to the time of his death.

Mr. Morgan stood for sterling honesty and was a fine example of the conscientious, successful business man. He told his workmen as well as his friends how to get the best out of life, and what is more, he showed them how. Strikes were never known in the Morgan & Wright plant. He mingled freely with his workmen and was the head of a big happy family. His name is known the world over, not only as a successful tire manufacturer and patentee of tire making processes and equipment, but as a great industrial leader.

In his leisure hours, Mr. Morgan was an exceptionally fine landscape artist. He painted for recreation and has many pictures of merit to his credit. A lover of the outdoors, for many years he cruised the Great Lakes on his fine steam yacht "Pathfinder." He was one of the founders and president of the Country Club of Beloit, Wisconsin, a member of the Oak Park Country Club, Chicago, Illinois; the Clearwater and Bellair Golf Clubs, Florida; Chicago Athletic Association; Chicago Yacht Club; life, governing and sustaining member of the Art Institute, Chicago, and of the Chicago Arts Club.

He is survived by his widow, Mrs. Mary A. Morgan, two daughters and two sons. Interment was in Rosehill Cemetery Mausoleum, Chicago, Illinois.

HEAD OF THE WORLD'S GREATEST WIRE MILL

Karl G. Roebling, president of John A. Roebling's Sons Co., manufacturers of insulated and other kinds of wire, Trenton, New Jersey, and grandson of the man who initiated the building of the Brooklyn Bridge, died of apoplexy on May 29 at Spring Lake, New Jersey, aged 47. Since assuming the presidency of the company in 1898, his business burdens have been very heavy and overwork had impaired his health. His untimely death, however, came as a great shock to his many friends, relatives and business associates.

Like the other members of the Roebling family, he began as a laborer and advanced from one department to another, familiarizing himself with every detail of the firm's production. He was a director of numerous other companies, including the Woven Steel Hose & Rubber Co., Trenton, New Jersey, and was a member of several clubs and commercial organizations.

Mr. Roebling is survived by his widow, three children, a brother and two sisters. Interment was at Ewing, New Jersey.

HEAD OF THE MERCER RUBBER CO.

William Henry Sayen, president of the Mercer Rubber Co., Hamilton Square, New Jersey, and president of the Valley Forge, Pennsylvania, Park Commission, died suddenly of heart disease at his home in St. Davids, Pennsylvania, on June 14, aged 73 years. Mr. Sayen had been active in business and civic welfare work until the time of his death, and had lived in or near Philadelphia, Pennsylvania, practically all of his life. He founded the Mercer Rubber Co., near Trenton, twenty-five years ago, and was active with his sons in its development. In addition he was connected with several civic and welfare organizations at St. Davids.

The deceased was born in Philadelphia in 1848 and saw active service in the Civil War as a drummer boy, being in action at the battle of Gettysburg. After the war he was made an honorary colonel. Some twenty-five years ago Mr. Sayen built one of the first bungalows in America on an island in Barnegat Bay. There "The Bold Buccaneers" were organized with the late Francis Fennimore as "pirate chief." He was a member of the Union League, of Philadelphia, and other organizations.

Besides his second wife, Mr. Sayen is survived by one daughter, Mrs. Emily Schultz, also of St. Davids, and three sons, Frederick and William H. Sayen, Jr., who were interested with their father in the Mercer Rubber Co. plant, and Osgood Sayen, who is serving with the French Army in France.

FORMER NEW JERSEY RUBBER MAN

Robert Edward Oakley, who for a number of years was associated with his brothers, Clifford H. and Lawrence M. Oakley in the rubber business, died recently at his home, 92 Dentz avenue, Trenton, New Jersey. He is survived by his widow, one son and a daughter. The interment was at Trenton.

PIONEER IN INSULATED WIRE

William L. Candee, who died April 24, at the age of 70, was one of the pioneers in the telephone industry and also an organizer and director of the Okonite Co., Passaic, New Jersey, manufacturer of insulated wire and cables. Six years ago he retired from business. In the early '90s he was captain of Company B, Twenty-third regiment, N. Y. S. N. G., resigning in 1893. He is survived by his widow, two daughters, and two sons, one of whom is W. C. Candee, of the Ackurate Rubber Co., New York, N. Y.

CITIZENS' MILITARY TRAINING CAMP

Announcement is made by the Commanding General, Headquarters 2nd Corps Area, Governor's Island, New York, that the War Department is reviving the Plattsburg idea with the following modifications:

The War Department is to pay all expenses for the successful applicants, including transportation, food, clothing, supplies needed, medical attention, dental work and entertainment. No pledge is required from anyone. All those who complete the camp will be given certificates and will be eligible for the organized reserves when they are formed. It is desired to obtain as candidates those who have had no previous military training although others will be considered.

Applications for the camp may be made at any of the branches of the Citizens' Military Training Camps Association; at any

Army post, or to any Army officer; to any Navy or Marine Recruiting Station; or direct to Major Harvey H. Fletcher, Recruiting Adjutant, Headquarters 2nd Corps Area, Governors Island, New York.

NEW TRADE PUBLICATIONS

"THE BLACK ART OF RUBBER COMPOUNDING—CHAT NO. 5." THE fifth in the series of pamphlets on rubber compounding is being distributed to the rubber manufacturing trade by Binney & Smith Co., 81 Fulton street, New York, N. Y. The current issue deals with some of the practical aspects of the application of their Micronex gas black to factory formulas, taking up the topics of moisture, mill room flying, calendering and black in tire treads.

"FANS FOR EFFICIENCY," TWO-COLOR FOLDER, NO. 4455, DESCRIBES the Ventura fans of the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania.

Orient—Dawn IS THE DOUBLE TITLE OF A NEW ILLUSTRATED GENeral and independent Dutch East Indian bi-monthly review, the December number of which has just been received.

The object of the magazine is to further a growing friendly understanding between the many nationalities represented in the Netherlands East Indies.

THE EDITOR'S BOOK TABLE

"CREDITS: HOW TO AVOID COMMERCIAL LOSSES (INCLUDING cancellations and returns)." Pamphlet for credit men distributed free by *The Credit Guide*, 415 Broadway, New York, N. Y. Thirty-three pages, 5 by 8 inches.

IN illustrating the usefulness of their own service, and in emphasizing the need of more exact and intimate knowledge of a debtor's true condition, before extending a line of credit, than is afforded by his own admissions and the information obtainable through ordinary channels, the authors point to the fact that during the past year, while the number of merchants in the country had not increased, failures, however, had increased over 400 per cent, in number and over $350,000,000 in amount. To help minimize such loss, *The Credit Guide* issues a list every week of "Credit Danger Notices," which numerous concerns testify has saved them from accepting the accounts of others who soon went bankrupt. Among the unfavorable signs listed in the reports are:

Noticeable slowing up in payments, collections filed, suits instituted for past-due accounts, habitual returning of goods, unjust cancellations, chattel mortgages on stock or fixtures, numerous inquiries received, overbuying or underselling, and caution suggested by creditors, all significant signals to a credit man and which, it is claimed, are of more value in gaging a prospective customer than old references or the reports of credit-rating agencies which lack means of "super-checking" accounts up to date.

"THE MOTOR TRUCK TERMINAL." BULLETIN NO. 7. ISSUED by the Firestone Ship-by-Truck Bureau, Firestone Park, Akron, Ohio, 1921. Copyright by the Firestone Tire & Rubber Co. Distributed gratis. Twenty-three pages, 6 by 9.

Makers of motor trucks, and the manufacturers of rubber tires and numerous accessories, are realizing more than ever that if the Ship-by-Truck movement is to gain any considerable impetus, "free lance" operations must be regulated, if not by force of law, then by economic measures that will be quite as effective. The best corrective thus far suggested is the motor-truck terminal.

The pamphlet emphasizes the present and prospective value of transporting goods by truck, particularly with regard to speed, low cost, and flexibility. It is also shown how, with motor terminals in large cities, the confidence of consignors and consignees can be won and held by making motor terminal receipts as valuable as those of a railroad freight terminal, and how the motor terminal, through suitable insurance and business-like methods, can hold the serving motor-truck concerns to strict account and directly advance and amply safeguard the interests of shipper and receiver.

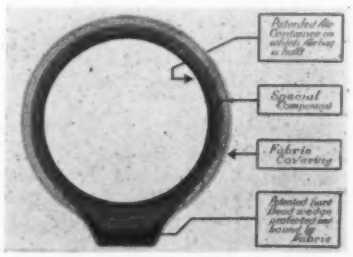
Of especial interest are the sections dealing comprehensively with the field, functions, types, organization, and operation of the motor terminal, as well as outlining its scope, solely and in inter-terminal cooperation, as a national industry.

"A FRENCH-ENGLISH DICTIONARY FOR CHEMISTS." BY AUSTIN M. Patterson, Ph. D., formerly Editor of *Chemical Abstracts*. John Wiley & Sons, Inc., New York. Flexible Cloth, 384 pages, 5 by 7 inches.

In this book the author has produced a companion volume to his "German-English Dictionary for Chemists," which will unquestionably meet with an equal measure of approval. The book contains over 32,000 entries covering the entire chemical field. Special attention has been paid to idiomatic phrases. All common words which are likely to appear in scientific literature are defined and terms from the new chemical warfare are included. Information on French chemical nomenclature is given in the introduction, also a few principles of grammar. Equipped with this book the reader of chemical literature is independent of any other French dictionary.

HERMETIC AIR-BAGS

The chief faults of the ordinary fabric air-bag are buckling and the short service obtained before it fails by bursting or cracking through by rough handling, owing to the rubber becoming injured by overcuring. These sources of weakness have been overcome in the constructional features of the air-bag shown herewith. Three noteworthy features of this air-bag are (1) its uniform expansion, (2) sufficient compression at the beads, (3) the low air-bag cost per tire.


Patented Air Container cut apart, the bag in half
Special Compound
Fabric Covering
Patented hard Bead wedge contacted and bound by fabric

SECTION OF THE HERMETIC AIR-BAG

The uniform and equal expansion is accomplished by building the bag upon an air-tight container of ring form similar to an inflated inner tube. A thick, heavy splice is thus produced where the ends are brought together giving at the joint much less expansion and contraction than in the rest of the bag.

Sufficient compression at the beads is secured by inserting or adding a ring of relatively hard, vulcanizable material on the inner circumference. This hard wedge not only holds the beads of the uncured tire in place, but gives to them the necessary compression during vulcanization.

The most important of all air-bag considerations is the air-bag cost per tire. Due to the simple method of manufacture, the same amount and quality of raw materials are used for producing a given size air-bag, at a much less cost than in ordinary practice. There is a further saving in cost as the present bag is built upon a tested air container originally, and is therefore perfect when vulcanized.

The factory records of a prominent tire manufacturer that uses Hermetic air-bags exclusively, shows an average of 45 cures per bag, the maximum number of cures for any one bag being 73 perfect tires. The percentage of seconds during the same month was less than 3/10 of one per cent. During the past six months the air-bag cost per tire on 33 by 4 shows a reduction or saving of more than $1.30 a tire.

The manufacture of air-bags of this construction is available to any tire manufacturer under shop license from the patentees.—Cupples Company, St. Louis, Missouri.

American Society for Testing Materials

At the twenty-fourth annual meeting of the American Society for Testing Materials held at Asbury Park, New Jersey, June 21 to 24, 1921, Committee D-13 on Textile Materials submitted the following report:

The definitions of terms relating to mechanical fabrics are offered as a plan for convenient reference to mechanical ducks in an effort to avoid confusion which now exists. At present, reference to mechanical ducks in terms of weight may mean weight per linear yard based on various widths used arbitrarily by the industries responsible for the development of these fabrics. The principal object of the proposed nomenclature is to standardize weight specifications to a square-yard basis. For the convenience of those who find it necessary to convert from the present linear-yard weight basis to the proposed square-yard weight basis, a conversion table is attached to the proposed tentative nomenclature for mechanical fabrics.

The proposed tentative specifications for imperfections and tolerances for 60-inch 17¼-ounce square-woven tire builder fabric consists of a list of tolerances to be used in connection with specifications submitted by consumers to manufacturers, and also includes a list of imperfections intended to serve as a glossary so manufacturers and consumers may be brought to a closer understanding as to the meaning of references to various imperfections in tire fabrics. While it is customary for tire fabric to be manufactured to specifications, these specifications vary considerably, according to the requirements of tire manufacturers based on their methods of operation, and an attempt to draw up definite specifications for fabrics is not considered to be desirable at this time. There has been some misunderstanding, however, between manufacturers and consumers as to allowable variations from specifications, and it is to provide basis for adjusting such conditions that these tolerances are proposed. These tolerances and imperfections have been developed by a sub-committee and are based on answers to a questionnaire submitted to tire fabric and tire manufacturing industries.

Committee D-13 through its sub-committees is engaged in the development of standards on the following subjects: test methods and measurements for fibers; test methods and specifications for yarns; specifications for fabrics; specifications for fabric-testing machines.

PROPOSED TENTATIVE DEFINITIONS[1] OF TERMS RELATING TO MECHANICAL FABRIC

Serial Designation: D — 21 T; Issued, 1921

1. The term "Mechanical Fabric" shall be understood to mean fabric manufactured to be used as an intermediate product in the making of some mechanically constructed article.

2. Mechanical fabrics shall be referred to by the following descriptive nomenclature:

(a) A word or phrase generally descriptive of the appearance of the material, or the use to which it is put.

(b) Weight in ounces per square yard. The words "oz. sq. yd." are to be written after the weight. To avoid confusion in regard to weight of material, it is suggested that immediately succeeding the square yard weight, the weight of the material on whatever basis may have been used previous to the adoption of these standards be inserted in brackets. Table I gives the conversion values of linear yard weight to square yard weight.

(c) Width in inches.

(d) Count, giving first the ends, and second the picks per inch.

EXAMPLE: Hose duck, 9 oz. sq. yd. (40 in. 10 oz.) 48 in. 28 by 18.

3. The following is a partial list of mechanical fabrics in general use:

TIRE BUILDER FABRIC. A square-woven fabric having usually 11-ply yarn both warp and filling.

TIRE CORD FABRIC. A fabric consisting of hawser cord yarn in the warp, with single yarn filling at intervals to keep warp threads together.

HOSE DUCK. A soft, plain-weave duck of plied yarns not finer than No. 8, made in weights from 10 to 24 oz. to the 40 in. width. When made of finer yarn than No. 8, it is classed as special hose duck.

[1] These definitions are issued under the fixed designation D — ; the final number indicates the year of original issue, or in the case of revision, the year of last revision.

TABLE I.—CONVERSION TABLE OF LINEAR YARD WEIGHT TO SQUARE YARD WEIGHT OF FABRIC

Weight, oz.	Width, inches																												
	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
8	9.60	9.29	9.00	8.73	8.74	8.23	8.00	7.78	7.58	7.38	7.20	7.02	6.86	6.70	6.55	6.40	6.26	6.13	6.00	5.88	5.76	5.65	5.54	5.43	5.33	5.24	5.14	5.05	4.97	4.88	4.80
9	10.80	10.45	10.13	9.82	9.53	9.26	9.00	8.76	8.53	8.31	8.10	7.90	7.71	7.53	7.36	7.20	7.04	6.89	6.75	6.61	6.48	6.35	6.23	6.11	6.00	5.89	5.79	5.68	5.59	5.49	5.40
10	12.00	11.61	11.25	10.91	10.59	10.29	10.00	9.73	9.47	9.23	9.00	8.78	8.57	8.37	8.18	8.00	7.83	7.66	7.50	7.35	7.20	7.06	6.92	6.79	6.67	6.55	6.43	6.32	6.21	6.10	6.00
11	13.20	12.77	12.38	12.00	11.65	11.31	11.00	10.70	10.42	10.15	9.90	9.66	9.43	9.21	9.00	8.80	8.61	8.43	8.25	8.08	7.92	7.76	7.62	7.47	7.33	7.20	7.07	6.95	6.83	6.71	6.60
12	14.40	13.94	13.50	13.09	12.71	12.34	12.00	11.68	11.37	11.08	10.80	10.54	10.29	10.05	9.82	9.60	9.39	9.19	9.00	8.82	8.64	8.47	8.31	8.15	8.00	7.85	7.71	7.58	7.45	7.32	7.20
13	15.60	15.10	14.63	14.18	13.76	13.37	13.00	12.65	12.32	12.00	11.70	11.41	11.14	10.88	10.64	10.40	10.17	9.96	9.75	9.55	9.36	9.18	9.00	8.83	8.67	8.51	8.36	8.21	8.07	7.93	7.80
14	16.80	16.26	15.75	15.27	14.82	14.40	14.00	13.62	13.26	12.92	12.60	12.29	12.00	11.72	11.45	11.20	10.96	10.72	10.50	10.29	10.08	9.88	9.69	9.51	9.33	9.16	9.00	8.84	8.69	8.54	8.40
15	18.00	17.42	16.88	16.36	15.88	15.43	15.00	14.60	14.21	13.85	13.50	13.17	12.86	12.56	12.27	12.00	11.74	11.49	11.25	11.02	10.80	10.59	10.38	10.19	10.00	9.82	9.64	9.47	9.31	9.15	9.00
16	19.20	18.58	18.00	17.45	16.94	16.46	16.00	15.57	15.16	14.77	14.40	14.05	13.71	13.40	13.09	12.80	12.52	12.26	12.00	11.76	11.52	11.29	11.08	10.87	10.67	10.47	10.29	10.11	9.93	9.76	9.60
17	20.40	19.74	19.13	18.55	18.00	17.49	17.00	16.54	16.11	15.69	15.30	14.93	14.57	14.23	13.91	13.60	13.30	13.02	12.75	12.49	12.24	12.00	11.77	11.55	11.33	11.13	10.93	10.74	10.55	10.37	10.20
18	21.60	20.90	20.25	19.64	19.06	18.51	18.00	17.51	17.05	16.62	16.20	15.80	15.43	15.07	14.73	14.40	14.09	13.79	13.50	13.22	12.96	12.71	12.46	12.23	12.00	11.78	11.57	11 37	11.17	10.98	10.80
19	22.80	22.06	21.38	20.73	20.12	19.54	19.00	18.49	18.10	17.54	17.10	16.68	16.29	15.91	15.55	15.20	14.87	14.55	14.25	13.96	13.68	13.41	13.15	12.91	12.67	12.44	12.21	12.00	11.79	11.59	11.40
20	24.00	23.23	22.50	21.82	21.18	20.57	20.00	19.46	18.95	18.46	18.00	17.56	17.14	16.74	16.36	16.00	15.65	15.32	15.00	14.69	14.40	14.12	13.85	13.58	13.33	13.09	12.86	12.63	12.41	12.20	12.00
21	25.20	24.39	23.63	22.91	22.24	21.60	21.00	20.43	19.89	19.38	18.90	18.44	18.00	17.58	17.18	16.80	16.43	16.09	15.75	15.43	15.12	14.82	14.54	14.26	14.00	13.75	13.50	13.26	13.03	12.81	12.60
22	26.40	25.55	24.75	24.00	23.29	22.63	22.00	21.41	20.84	20.31	19.80	19.32	18.86	18.42	18.00	17.60	17.22	16.85	16.50	16.16	15.84	15.53	15.23	14.94	14.67	14.40	14.14	13.89	13.66	13.42	13.20
23	27.60	26.71	25.88	25.09	24.35	23.66	23.00	22.38	21.79	22.23	20.70	20.20	19.71	19.26	18.82	18.40	18.00	17.62	17.25	16.89	16.56	16.24	15 92	15.62	15.33	15.05	14.79	14.53	14.28	14.03	13.80
24	28.80	27.87	27.00	26.18	25.41	24.69	24.00	23.35	22.74	22.15	21.60	21.07	20.57	20.09	19.64	19.20	18.78	18.38	18.00	17.63	17.28	16.94	16.62	16.30	16.00	15.71	15.43	15.16	14.90	14.64	14.40
25	30.00	29.03	28.13	27.27	26.47	25.71	25.00	24.33	23.68	23.08	22.50	21.95	21.43	20.93	20.45	20.00	19.57	19.15	18.75	18.37	18.00	17.65	17.31	16.98	16.67	16.36	16.07	15.79	15.52	15.25	15.00
26	31.20	30.19	29.25	28.36	27.53	26.74	26.00	25.30	24.63	24.00	23.40	22.83	22.29	21.77	21.27	20.80	20.35	19.91	19.50	19.10	18.72	18 35	18.00	17.66	17.33	17.02	16.71	16 42	16.14	15.86	15.60
27	32.40	31.35	30.38	29.45	28.59	27.77	27.00	26.27	25.58	24.92	24.30	23.71	23.14	22.60	22.09	21.60	21.13	20.68	20.25	19.84	19.44	19.06	18.69	18.34	18.00	17.67	17.36	17.05	16.76	16.47	16.20
28	33.60	32.52	31.50	30.55	29.65	28.80	28.00	27.25	26.53	25.85	25.20	24.59	24.00	23.44	22.91	22.40	21.91	21.45	21.00	20.57	20.16	19.76	19.38	19.02	18.67	18.33	18.00	17.68	17.38	17.08	16.80
29	34.80	33.68	32.63	31.64	30.71	29.83	29.00	28.22	27.47	26.77	26.10	25.46	24.86	24.28	23.73	23.20	22.70	22.21	21.75	21.31	20.88	20.47	20.08	19.70	19.33	18.98	18.64	18.32	18.00	17.69	17.40
30	36.00	34.84	33.75	32.73	31.76	30.85	30.00	29.19	28.42	27.69	27.00	26.34	25.71	25.12	24.55	24.00	23.48	22.98	22.50	22.04	21.60	21.18	20.77	20.37	20.00	19.64	19.29	18.95	18.62	18.31	18.00
31	37.20	36.00	34.88	33.82	32.82	31.89	31.00	30.16	29.37	28.62	27.90	27.22	26.57	25.95	25.36	24.80	24.26	23.74	23.25	22.78	22.32	21.88	21.46	21.06	20.67	20.29	19.93	19.58	19.24	18.92	18.60
32	38.40	37.16	36.00	34.91	33.88	32.91	32.00	31.14	30.32	29.54	28.80	28.10	27 43	26.79	26.18	25.60	25 04	24.51	24.00	23.51	23.04	22.59	22.15	21.74	21.33	20.95	20.57	20.21	19.86	19.53	19.20
33	39.60	38.32	37.13	36.00	34.94	33.94	33.00	32 11	31.26	30.46	29.70	28.98	28.29	27.63	27.00	26.40	25.83	25.28	24.75	24.24	23.76	23 29	22.85	22.42	22.00	21.60	21.21	20.84	20.48	20.14	19.80
34	40.80	39.48	38.25	37.09	36.00	34.97	34.00	33.08	32.21	31.38	30.60	29.85	29.14	28.47	27.82	27.20	26.61	26.04	25.50	24.98	24.48	24.00	23.54	23.09	22.67	22.25	21.86	21.47	21.10	20.75	20.40
35	42.00	40.65	39.38	38.18	37.06	36.00	35.00	34.06	33.16	32.31	31.50	30 73	30.00	29.30	28.64	28.00	27.39	26.81	26.25	25.71	25.20	24.71	24.23	23.77	23.33	22.91	22.50	22.11	21.72	21.35	21.00
36	43.20	41.81	40.50	39.27	38.12	37.03	36.00	35.03	34.11	33.23	32.40	31.61	30.86	30.14	29.45	28.80	28.17	27.57	27.00	26.45	25.92	25.41	24.92	24.45	24.00	23.56	23.14	22.74	22.34	21.97	21.60

RUBBER BELT DUCK. A soft, plain-weave duck of plied yarns not finer than No. 8, weight ranging from 22 to 36 ounces to 42 inches width. When made of finer yarn than No. 8, it is classed as special belt duck.

BALATA BELT DUCK. A closely woven fabric made of hard twisted plied yarn usually made in wide widths, weight being based on the square yard.

OIL BELT DUCK. A closely woven fabric of plied yarns not over No. 8, made in a variety of widths, the weight being based on the square yard.

NUMBERED DUCK. A plain woven fabric of plied yarns ranging from coarse to fine numbers, weight being based on 32-inch width one yard long.

ARMY DUCK. A fabric made in closely woven plied yarns, weight being based on 28½-inch width.

SINGLE FILLED OR FLAT DUCK. A fabric made of single yarn, plain weave, the weight being based on 30-inch width.

ENAMELING DUCK. A plain woven fabric with laid warp and plied yarn filling, weight being based on 46½-inch width.

PROPOSED TENTATIVE SPECIFICATIONS[1] FOR IMPERFECTIONS AND TOLERANCES FOR 60-INCH 17¼-OUNCE SQUARE-WOVEN TIRE BUILDER FABRIC

Serial Designation: D — -21 T; Issued, 1921

IMPERFECTIONS

Definition

1. Imperfections shall be those defects in material and workmanship which are in large measure capable of reduction and control by supervision and which, though important, do not form an essential element of the specifications. They may be classified as such deviations from the qualitative characteristics of the perfect fabric as shall materially depreciate its commercial value.

Misweaves

2. The following imperfections are to be classified as misweaves: mispicks, double picks, floats, broken picks and ends, dropped threads, wrong draws, filling cuts, reed marks, light and heavy strips, smash.

(a) Heavy strip is a place in the fabric which contains more than the specified number of picks per inch.

(b) Thin strip is a place in the fabric which contains less than the specified number of picks per inch.

(c) Reed mark in the fabric is caused by a sprung reed in the loom during weaving and appears in the fabric as though two warp threads had been forced apart with the result that the next threads are very close together.

(d) Wrong draw is caused by drawing warp threads through wrong harness and appears in the fabric as a streak lengthwise due to the filling floating over more than one thread.

(e) A mispick is a missing or partly missing pick and appears as a streak across the width of the fabric.

Deductions

3. Misweaves may be sufficient cause for deductions if the fabric is weakened thereby either as it is or in later processes, unless the misweave is satisfactorily repaired.

Rejections

4. Misweaves are sufficient cause for rejection of a roll if they are of such extent, importance and frequency as to require cutting the fabric in four or more places per 100 yd.

Imperfect Selvage

5. Tight, loose, cut, weak and nicked or wavy selvage may be considered imperfect selvage.

Deductions

6. Imperfect selvage may be cause for deductions if it is sufficiently imperfect to cause trouble or waste of material in processing.

Rejection

7. Imperfect selvage may be sufficient cause for rejection if its extent, frequency and importance requires cutting of the fabric in four or more places per 100 yd.

Knots

8. No knots are allowable in the ply yarn except in colored identification threads and in selvage.

Deductions

9. Knots in the ply yarn may be cause for deductions. An allowance of one-quarter per knot is suggested.

Rejections

10. Knots in the ply yarn may be sufficient cause for rejection if they occur in excess of 25 knots per 100 yds. of the fabric.

[1]These specifications are issued under the fixed designation D — ; the final number indicates the year of original issue, or in the case of revision, the year of last revision.

Broken Threads

11. All broken threads should be properly repaired.

Deductions

12. Broken threads although repaired may be sufficient cause for deductions if they cause reduction of strength below the tolerance for individual tests or cause waste of material.

Rejections

13. Broken threads may be sufficient cause for rejection of a roll, if they are of such extent, frequency, and importance as to require cutting the fabric in four or more places per 100 yd.

Oil Spots

14. Oil spots or oily yarn should be reduced to the smallest possible number and if present should be thoroughly removed.

Deductions

15. Oil spots or oily yarn may be cause for deduction if of sufficient size to require the cutting and waste of fabric.

Rejections

16. Oil spots or oily yarn may be sufficient cause for rejection of a roll if they are of such extent, frequency and importance as to require the cutting of the fabric in four or more places per 100 yd.

TOLERANCES

Definition

17. Tolerances shall be the limits within which a textile must come in its specified characteristics in order that it shall constitute a good delivery on contract. They may be classified as the allowable limits of the quantitative characteristics of the fabric as defined in the specifications. The following tolerances are based upon the Standard General Methods for Testing Cotton Fabrics (Serial Designation: D 39) of the American Society for Testing Materials.[2]

Width

18. (a) No individual measurement made to determine the width of the fabric shall be more than 2 per cent over or one per cent under the specified average width.

(b) The average width determined by measurements shall be not more than one per cent over nor 0.5 per cent under the specified average width.

Weight per Square Yard

19. The weight of the fabric determined by test shall be not more than 1.5 per cent under nor more than 3 per cent over the specified weight.

Count per Inch

20. The count per inch determined by test shall be not more than 0.2 ends over nor 0.4 ends under the specified count and not more than one pick over or under for the filler.

Bow

21. The bow determined by test shall be not more than ¼-inch over or under the bow specified.

NOTE.—Bow should be ascertained by five determinations made throughout the roll commencing at least 10 yards from either end of roll.

Off-square

22. The allowable variation in the off-square of the fabric shall be 3 per cent over or under the specified off-square.

Gage

23. (a) The individual measurements of the thickness shall not vary more than 0.005-inch under or over the specified thickness.

(b) The average thickness determined by test shall not vary more than 0.002-inch under nor 0.003-inch over the specified thickness.

Tensile Strength

24. Individual test results on warp and filling shall be not more than 5 per cent below the specified tensile strength. The average tensile strength of the warp and the average tensile strength of the filling found by test shall be not less than the specified tensile strength.

[2]A.S.T.M. Standards Adopted in 1920.

THE "BULL GRIP" THAT STICKS AND STRETCHES

The "Bull Grip" inner tube patch equipment consists of patching rubber which is all gum, averaging 5/128 and 6/128-inch in thickness. The cement is of the best quality, packed in ¾ by 4-inch lead, clipped end tubes, with polished metal buffers 1½ inches in diameter. The manufacturer guarantees Bull Grip to vulcanize better than steam, to stretch with the tube, and not to deteriorate for a period of 12 months, the patch sticking and holding as long as the tube lasts.—Bull Grip, Inc., Atlanta, Georgia.

What the Rubber Chemists Are Doing

KEEPING QUALITIES OF PLANTATION RUBBER[1]

THE conditions that have prevailed for a year in the crude rubber market have resulted in the accumulation in storage in the Far East, London, New York, and other points, of enormous stocks of plantation rubber, regarding the keeping qualities of which expert opinion is desirable.

The following expert views on this topic, therefore, have a timely interest for crude rubber producers, dealers and rubber goods manufacturers. It should be noted that the author's remarks apply more particularly to tropical conditions.

Most plantation rubber, as such, has only a short existence. Between harvest and vulcanization in the rubber factory, not more than a few years elapse, as a rule, and little is heard of serious deterioration during that time. The general conclusion is that first-grade plantation rubber stands keeping for some years very well; yet there is no doubt that even excellent rubber may completely deteriorate in the course of years. For instance, a piece of smoked sheet which had been awarded a first prize at the London Rubber Exhibition of 1911, after seven years' keeping in the tropics, had become absolutely brittle and weak by 1918, with a viscosity of only three units, while vulcanization gave an unsatisfactory spongy mass.

In actual practice the changes which take place in the product during the first two or three years are the most important. Information is still incomplete on many points, for instance, on the difference between keeping in subdued light, or in the dark, in a wet or dry atmosphere, at tropical or European temperatures, no accurate data are as yet available.

From our experience with hundreds of samples, kept at a fairly regular temperature of 27 degrees C (78.6 degrees F.) in cupboards, we may state that under such circumstances the rubber does not show appreciable deterioration in appearance. The very light color of pale crêpe becomes decidedly darker in all cases, but no other visible change occurs, provided the samples remain dry enough so that no mouldiness or spots appear.

INNER PROPERTIES

Tensile strength in many cases may remain constant for periods of at least four years. We retested many samples which after three to four years showed the same excellent strength as when tested a few weeks after preparation. Other samples, however, showed a gradual decrease. No apparent reason has as yet been discovered as to why ordinarily prepared samples should in some cases remain constant in properties, and in others show a slow deterioration.

TIME OF CURE AND SLOPE

The time of cure in a number of cases showed a decrease of five to ten minutes on keeping, but in others remained constant, or increased. The causes of such changes are not yet cleared up. Preliminary review of data indicates that where rate of cure was retarded by some cause, a decrease in time of cure gradually sets in, while rapid-curing rubber often showed an increase, so that in both cases the rate of cure, on keeping, gradually returned to more normal values.

The slope generally shows no change, or only small variations in which, so far, no regularity could be detected.

VISCOSITY

Viscosity is perhaps the figure in which a change is first to be detected. While the properties after vulcanization often remain the same for a year or more—and only begin to change by longer keeping—the viscosity often begins to decrease sooner. Most first-grade samples, crêpe or sheet, remain constant in viscosity during several months or a year, but then gradually show a decrease which seems to continue slowly on further keeping.

The above statements all relate to estate samples prepared in the ordinary manner and taken at random from the output of a large number of estates. Data on keeping qualities in general do not point to a large influence of the method of preparation on the keeping qualities of first-grade rubber. Traces of special coagulants, such as sulphuric acid or alum, were not found to cause larger changes than the ordinary dose of acetic acid; neither did exaggerated crêping cause any marked or rapid deterioration in the raw product.

PACKING AND STORAGE

Packing the rubber only when quite dry and in dry chests, taking care that the chests do not get wet during transportation or in a damp shelter, and storing the rubber in a dry place with sufficient ventilation, especially between chests and floor, are the most necessary precautions for keeping rubber, whether in the tropics or in storage in temperate climates.

[1] "Estate Rubber, Its Preparation and Testing." By Dr. O. de Vries, 1920. Abstract from Chapter 12.

EFFECT OF MOULD ON RUBBER QUALITY[1]

Factory experience has shown that wet, mouldy smoked sheet rubber almost invariably retards the rate of cure and gives quite an inferior vulcanized product. Light mould, on the other hand, very often yields a normally cured rubber, but some samples have been obtained in which even a light mould has a deleterious effect. The greatest drawback in having such material in the factory is the fact that it necessitates extra work for inspection and handling in order that it may be segregated and separately tested before it can be safely used. Heavy wet mould is not often met with, but a light mould is quite common.

Testing the effect of a heavy, wet mould presents some difficulties, as one cannot say what the quality or rate of cure of the rubber would have been had it been properly cured and free from mould, but in the case of a light mould the effect can be judged by mixing and vulcanizing separately the sound and mouldy portions of the sheets.

Results are here given on one sample which has been tested on the separated sound and mouldy portions.

	Clean	Mouldy
Time of cure (minutes)	117	132
Rate of cure (per cent of standard)	128	114

It will be seen that there is a distinct difference in rate of cure between clean and mouldy parts of the sheet. The clean part vulcanizes faster than the mouldy part. The above figures represent the mean of two independent vulcanizations which were in close agreement and are based on the coefficient of vulcanization determined by analysis. So far as can be judged, without further details of the physical properties of the clean and mouldy parts, there is little or no difference in quality between the two portions.

Except for the mouldy patches, the rubber was of normal appearance, medium shade, glossy surface, and no defects. The mouldy portions were sharply defined so that the clean and mouldy parts were easily separated. It was noticed that the mouldy parts after washing off the mould were darker in color than the remainder. A sheet wiped clean showed irregular dark patches exactly as described by Hartjens.[2] The patches were irregular in size and shape, just as are the patches of mould growth, and darker in color than the remainder of the rubber, but not less translucent.

[1] "Mouldy Sheet and the Effect of Mould on Quality." By H. P. Stevens. Bulletin of the Rubber Growers' Association, Vol. 3, No. 2, February, 1921.
[2] "Spots on Sheets," Archief voor de Rubbercultuur, April, 1920.

Hartjens varied the conditions of manufacture in order to trace the origin of these spots or patches and came to the conclusion that they could be connected with the use of sulphite and bisulphite of soda, or a combination of both. Small amounts of these chemicals seldom produce spots, but larger proportions may produce very dark and distinct spots.

It is, therefore, possible that these dark spots are in some way connected with mould growth and also with the use of sulphite and bisulphite in sheet manufacture. There are insufficient data to explain what the connection may be. Possibly the dark parts retain more moisture than the light and are therefore more prone to develop mould. In any case, the observations call for an investigation of the effect of sulphite and bisulphite on the liability of smoked sheet to go mouldy.

Sodium sulphite is used in only very small quantities to keep the latex fluid, but bisulphite is sometimes used in larger quantities to keep the sheet light in color, owing to the marked objection to so-called "oversmoked" sheet. If found that the use of bisulphite tends to cause mould it would probably be better to risk the sheet being dark in color.

It is known that bisulphite hinders the drying of crêpe rubber, that is to say, rubber so treated tends to retain moisture, and what is true of crêpe is probably true of sheet. Sheet which tends to retain moisture, even if thoroughly smoked, will tend to take up moisture again at the first favorable opportunity, and the more moisture present, the greater the liability to mould. Hence there are already definite reasons for thinking that sodium bisulphite may cause mould to develop in smoked sheet, especially in transit.

The effect of bisulphite is probably aggravated by the circumstance that so much of it is of very poor quality. It is quite likely that the sodium sulphite and other impurities are as responsible for the retention of water as the bisulphite itself, and where possibly large quantities of poor quality material have to be added to produce the necessary effect on the color, it is easily realized that the quality of the rubber and resistance to mould are impaired.

The Rubber Growers' Association recommendations for the treatment of latex and the curing of sheet rubber state that sodium bisulphite should not be used for the preparation of sheet rubber.

STORAGE OF PLANTATION RUBBER

Henry P. Stevens, consulting chemist to the Rubber Growers' Association, has recently reported on the storage of plantation rubber, of which the following conveys the principal points.

Plantation rubber does not deteriorate rapidly but is remarkably stable and little altered after long storage, provided certain elementary precautions be taken. The most important of these is protection from direct sunlight. Fluctuations of temperature have practically no effect on rubber and it is doubtful whether even tropical temperatures cause any appreciable deterioration.

In London, laboratory-stored samples of properly prepared rubber dating back ten years and more have in no instance shown any marked signs of deterioration. At the most, the surface becomes very slightly adhesive. This is by no means the case generally and many samples of rubber made eight and ten years ago cannot be distinguished from rubber made yesterday.

The peculiar property of rubber to freeze at moderately low temperatures may have given rise to the assumption that the rubber had perished on keeping. Such is not the cause, and if gently warmed at temperature under that of boiling water, rubber soon becomes flexible, elastic and translucent as originally.

When stored raw rubbers are broken down, mixed and vulcanized, they behave in normal manner. Any differences shown do not appear to be greater than in fresh samples recently imported. No difference in vulcanizing properties could be detected in this same smoked sheet, the first half of which was tested in England a year previous to the second half which was retained in the East for a year before importation for test. Old samples of plantation rubber vulcanized in comparison with current samples of the same rubber showed only such small variations as would be found with fresh consignments.

It is evident from the foregoing that deterioration need not take place when ordinary pale crêpe or smoked sheet rubber is stored for long periods under suitable conditions.

Fewer data are available as regards the lower grades, but it is probable that these will keep satisfactorily if properly cleaned and dried. But rubber which contains an appreciable proportion of organic impurity and is exposed to conditions under which putrefaction sets in, will rapidly deteriorate.

"XLO" ACCELERATOR

"XLO" is the trade designation of a recently perfected vulcanization accelerator from which excellent results have been obtained. It is specially recommended for automobile tire stocks, inner tubes and high-class mechanical goods. It is magnesiated di-phenylguanadine in the constant proportions of one-third of the former to two-thirds of the latter. From one-quarter to three-quarters of one per cent of the rubber content of a mixing are the recommended proportions of this accelerator to be used in practical work.

CHEMICAL PATENTS

THE UNITED STATES

TIRE FILLING COMPOSITION COMPRISING THE FOLLOWING INGREDIENTS and proportions: vegetable oil 74 per cent; magnesium oxide 2.2 per cent; ultramarine 2.2 per cent; litharge 2.2 per cent; oakum 1.9 per cent; chloride of sulphur 17.5 per cent.—John A. Schmidtke, Calgary, Alberta, Canada. United States patent No. 1,376,973.

HALOGENATED RUBBER COMPOUND, THE MOLECULAR STRUCTURE of which includes more than two halogen atoms and an atom of a vulcanizing agent.—Clayton W. Bedford and William J. Kelly, assignors to The Goodyear Tire & Rubber Co., all of Akron, Ohio. United States patent No. 1,377,152.

RUBBER-LIKE MATERIAL PROCESS, COMPRISING MACERATING heating and extracting the fleshy parts of cactus, adding a catalyzer containing a mineral acid radical, concentrating the juice, adding a solution of Pará rubber, linseed oil, and a mixture of asphaltum and sulphur and boiling, drying and oxidizing the resultant mass.—John C. Wichmann, Los Angeles, California, United States patent No. 1,379,149.

RUBBER-LIKE MATERIAL PROCESS, COMPRISING MACERATING THE fleshy parts of the yucca plant, heating it above the boiling point of water, extracting the juice to which is added a catalyzer consisting of a mixture of sodium tungstate, concentrating the juice, adding a solution of Pará rubber, linseed oil and a molten solution of asphalt and sulphur, boiling the mixture under agitation, drying and oxidizing the resultant mass.—John C. Wichmann, Los Angeles, California. United States patent No. 1,379,150.

THE DOMINION OF CANADA

ACCELERATION OF VULCANIZATION PRODUCED BY THE USE OF alkylated, dialyated or methylated dithiocarbamic acid.—The Michigan Chemical Co., Bay City, Michigan, assignee of Stuart B. Molony, Wellesley Hills, Massachusetts, U. S. A. Canadian patent No. 211,926.

ACCELERATION OF VULCANIZATION BY THE USE OF AN ALKYLATED, methylated or mono-methyl dithiocarbamate of a metal. The Michigan Chemical Co., Bay City, Michigan, assignee of Stuart B. Molony, Wellesley Hills, Massachusetts, and Yasujuro Nikaido, Bay City, Michigan, both in U. S. A. Canadian patent No. 211,927.

ACCELERATION OF VULCANIZATION BY THE USE OF THE METHYL-ester of phenyl dithiocarbamic acid; the metallic salts of phenylated dithiocarbamic acid; or the metallic salts of phenyl dithiocarbamic acid.—The Michigan Chemical Co., assignee of Stuart

B. Molony, Wellesley Hills, Massachusetts, and Yasujuro Nikaido, Bay City, Michigan—both in U. S. A. Canadian patent No. 211,928.

THE UNITED KINGDOM

PREPARATION OF INDIA RUBBER. FRESH LATEX IS TREATED WITH an alkalized phenol, subsequently coagulated by addition of an acid or acid salt, preferably an acidified solution of magnesium sulphate. The coagulum is dehydrated mechanically. The dehydrated rubber may be softened with hot water, and then sheeted, crêped or rolled in cylinders.—S. C. Davidson, Sirocco Engineering Works, Belfast. British patent No. 159,602.

TIRE TREAD COMPOSITION CONSISTING OF 25 TO 40 PER CENT raw or reclaimed rubber or mixtures, and 70 to 60 per cent carborundum or a mixture of carborundum and other abrasives with sufficient sulphur for vulcanizing.—J. R. Cooper, 46 Hatfield Road, Birchfield, Birmingham; T. E. Lockhart, Brooklyn, Henley-in-Arden, Warwickshire; and R. H. Osler, 36 Cannon Street, Birminham. British patent No. 159,608.

DEVULCANIZING WASTE RUBBER BY MEANS OF AN EMULSOID colloid solution in water of tar, pitch resin, gum or balsam. The ground rubber is boiled up with this solution, a sulphur solvent such as turpentine and a detergent alkaline solution. The boiled rubber is washed and dried.—C. F. Willard, San Diego, California, U. S. A. British patent No. 159,987.

RUBBER COMPOSITIONS CONTAINING LAKE PIGMENTS, OR FILLERS, such as saw-dust, leather waste, cork-dust, wool-waste, etc., which are injured by known vulcanization processes, are vulcanized in the cold by alternate treatment with sulphur dioxide and hydrogen sulphide.—S. J. Peachey, 5 Yew Tree Road, Davenport Cheshire, and A. Skipsey, Red Lea, Scarborough, Yorkshire. British patent No. 106,499.

PUNCTURE-CLOSING COMPOSITION. A FLUID CONSISTING OF glycerine, water and Castile soap.—C. Tuckfield, 5 Thames View, East Molesey, Surrey. British patent No. 160,505.

FIRE-PROOFING, WATER-PROOFING, AND METALLIZING LACE, ETC., is effected by immersion of the fabrics in an emulsion of an aqueous solution of sodium biborate and sodium silicate, a solution of rubber in naphtha and amyl acetate and metal powder.—A. Norweb, 26 Fisher Gate, Nottingham. British patent No. 160,627.

REGENERATING INDIA RUBBER. GROUND VULCANIZED RUBBER mixed with about 10 per cent by weight of water containing two per cent of glycerine and two per cent of paraffine. The mixture is heated to reaction. O. R. Bouvery, Villa St. Georges, Allée des Muriers, and F. P. Conort, 19 rue de l'Orangerie—both in Algiers, Africa. British patent No. 160,779.

SELF-LUBRICATING COMPOSITION FOR BEARINGS, CONSISTING OF A mixture of about 100 parts new or preferably regenerated rubber devulcanized by process described in British patent No. 160,779; 200 parts graphite, and 90 parts sulphur or a metallic sulphide, molded under pressure and vulcanized at 165 to 170 degrees C.—O. R. Bouvery, Villa St. Georges, Allée des Muriers, and F. P. Conort, 19 rue de l'Orangerie—both in Algiers, Africa. British patent No. 160,780.

RETREADING TIRES. THE TREADS OF WORN TIRES ARE EXPOSED TO a flame to desulphurize the rubber and render it sticky. A cement of rubber in carbon tetrachloride containing a small amount of sulphur is spread over the surface, and when this is dry a new tread is applied. The tire is then vulcanized as usual.—E. Nestler, Bergenfield, New Jersey, U. S. A. British patent No. 160,805.

RUBBER PAINT CONSISTING OF RUBBER ADDED TO DISSOLVED asphalt and oleates or stearates of metals and vulcanized by means of sulphur or suitable sulphur compound and heat.—C. H. Ivinson, 72 Coombe Lane, Wimbledon, and G. S. Roberts, 74 Earls Court Road, Kensington, both in London. British patent No. 161,201.

GERMANY

VULCANIZED PRODUCTS OF GREAT STRENGTH AND EXTENSIBILITY are obtained by adding to the materials to be vulcanized metallic oxides or peroxides or organic or inorganic compounds which yield part of their oxygen at the temperature of vulcanization, together with aliphatic or aromatic amines or ammonia compounds or their derivatives or salts. For example, antimony pentoxide, lead oxide, or lead peroxide may be added, together with diethylamine or aniline sulphate.—Farbenfabriken formerly Friedrich Bayer & Co., Leverküsen near Köln-on-Rhein. German patent No. 328,610 February 20, 1917.

LABORATORY APPARATUS

ELECTRICALLY-HEATED WATER-BATH

THE illustration shows the exterior view of a new electrically heated water-bath for laboratory use. The apparatus has a heavy copper tank, tinned on the inside with heavy asbestos outer covering. The constant temperature regulation is by means of a bi-metallic regulator giving a temperature control to about one degree C. The temperature range, without cover, is from that of the room to about 65 degrees C.; with cover, from room temperature to about 100 degrees C.—The Thermo Electric Instrument Co., Newark, New Jersey.

SMALL ELECTRIC WATER-BATH.

LATEX AND RUBBER FROM INDIVIDUAL TREES[1]

The results given in this preliminary communication indicate that on different dates the same tree gives latex which is approximately the same in amount and in rubber content and which, when suitably treated, yields rubber showing approximately the same viscosity and vulcanizing properties (tensile strength, time of cure, slope). Different trees are found to show considerable differences in the properties of the latex and rubber which they yield. Among the 21 trees for which data are given the daily yield varies from 4 to 71 grams, the rubber content of the latex from 17 to 50 per cent, the viscosity from 14 to 90, and the time of cure from 90 to 160 minutes.

[1]O. de Vries, Archief voor de Rubber-cultuur, 4, 1920, 249,271.

ACTION OF SULPHURIC ACID ON CAOUTCHOUC[1]

Cold concentrated sulphuric acid converts raw rubber immediately into a hard, brittle mass which after several days becomes soft again. The action is accompanied by the evolution of sulphur dioxide, and the soft product becomes hard again when treated with water. Benzene solutions of raw rubber, gutta percha, and artificial dimethyl-caoutchouc H, yield white solid substances which may be powdered and constitute oxidation products of the rubber. The action of sulphuric acid and the nature of the product are controlled by the nature of the solvent, by the quantity and particularly by the duration of the action of the acid, and by the concentration and nature of the rubber.

[1]F. Kirchhof. Kolloid Zeitschrift, 1920, 27, 311-315.

ACCELERATOR PATENTS

In response to numerous requests there appears elsewhere in this issue of THE INDIA RUBBER WORLD a list of American and foreign patents on vulcanization accelerators. This list has been brought up to date and may be accepted as covering all the materials so far patented as vulcanization accelerators.

Carbons and Hydrocarbons Used in the Rubber Industry

A Study of Carbon Blacks. Oils, Fats and Waxes of Mineral Origin

By Frederic Dannerth, Ph.D.

THE materials used for imparting a black color to rubber compounds are either pitches or carbon pigments. The former class includes the pitch obtained from coal-tar; blown or oxidized petroleum pitch; asphalt pitches; gilsonite products, wood pitch and stearin pitch. The carbon pigments include graphite, powdered bituminous coal, bone black, lampblack, and gas black.

The pitches, or "hydrocarbons" as they are called in the factory, are valuable chiefly because they render the compound oil-resistant and steam-resistant. At the same time they impart a good black color to the finished product, especially when used in conjunction with lead compounds. Their principal value, however, lies in the fact that compounds containing 5 and even 10 per cent of these hydrocarbons show a great resistance to aging. In other words, the material, because of its wax-like character, has mixed with the other materials of the compound in such a way that all or most of the minute pores have become sealed. The result is that the oxygen of the air cannot attack the rubber as would otherwise be the case. The *life* of the compound is prolonged, and the product maintains its good qualities long after it has left the rubber goods factory.

PART I. THE CARBONS

Of the carbon pigments mentioned above, attention should be called to the value of powdered bituminous coal as a compounding mineral filler especially adapted for steam packings. For this purpose it must be of a fineness equal to 200-mesh and preferably 300-mesh. Lampblack or oil carbon black has been used for a considerable period in compounds of all descriptions and uses, because of the fineness of its particles and the black color which it imparts. As a rule it represents the condensed soot produced when high boiling oils of petroleum and coal-tar are burned.

Gas carbon blacks are obtained by burning natural gas in such a way as to cause separation of the carbon. They have also been produced experimentally by atomizing petroleum residues in hot iron retorts. In this way the liquid is converted into a gas very rich in hydrocarbons of the ethylene series. The specific gravity of this material, after complete exhaustion of the air, was found to be 1.7290. Owing to its peculiar method of manufacture carbon produced from natural gas is practically free from oily matter and its particles are in an extremely fine state of sub-division. The melting point of carbon is above 6500 degrees F. This latter fact in itself makes it a material of preeminent importance in cases where the finished rubber product is exposed to high temperatures.

Graphite, artificially produced, has recently been considered as a compounding ingredient for the rubber industry. It was discovered some time ago that graphite can be obtained by suitable decomposition of a carbide. This artificial graphite cannot be produced by mere heating of pure carbon. The industrial process consists in using anthracite, with about 10 per cent of ash, as a furnace charge. The anthracite coal may be converted into graphite while in powdered form. A furnace 15 feet long will consume 1000 h.p. in this operation.

VALUATION OF A COMPOUNDING INGREDIENT

The questions which arise in connection with the use of carbons in rubber compounding naturally vary from one case to another, depending upon the use to which the finished rubber product is to be put. There are, however, certain points which apply in many instances, and in the case of a carbon black used for rubber compounding a complete investigation should furnish answers to the following questions which refer only to carbon black:

1. What influence does it exert on the tensile strength, elasticity, elongation before rupture, permanent set, and life, of a rubber compound?
2. How does it influence the density and toughness of the compound, and its resistance to abrasion?
3. Does it "fly" in the mixing room and is it injurious to the health of the workmen?
4. Can it be used to advantage to replace rubber?
5. What advantage has this material over zinc oxide?
6. What is the maximum amount which can be used for every 100 pounds of rubber in a rubber compound?
7. What is the maximum percentage which can be used to advantage?
8. Does the use of this black in a compound make it impossible to use any other materials?
9. In which rubber compounds can it be used to best advantage?
10. In which rubber compounds should it be omitted?
11. In what physical condition should this material be when it is delivered to the rubber manufacturer?
12. How should it be prepared at the rubber factory in order to incorporate it properly with the dough in rubber compounding?
13. What specification should a black meet if it is to be used to best advantage?
14. How much mineral matter, carbon, and oil does it contain?
15. What advantage does it offer over lampblack, or over powdered coal?
16. What is the volume cost of a rubber compound containing this material as compared with a similar rubber compound containing an equal weight of zinc oxide?
17. What defects will arise in the process of mixing or in the process of vulcanizing, if it is improperly prepared?
18. What defects will arise in the use of a rubber product containing this material, if it is not properly incorporated with the compound in the rubber factory?
19. Is this black acted on by any of the other materials used in rubber compounding?

VOLUME COST

Although rubber and the various compounding materials are purchased and sold by the pound, it will be realized on close examination that the majority of rubber products are sold on the basis of volume. For that reason, the older method of calculating costs of compounds has now been supplemented by the determination of the volume cost of the compound. As a standard of comparison one may choose one cubic foot and note the number of pounds of the material required to fill that volume. For example:

	Specific Gravity	One Cubic Foot — Weighs, Pounds	Costs
Water	1.00	62.5 @ ...	.....
Rubber	0.93	58.0 @$0.25	$14.50
Zinc oxide	5.75	360.0 @ .10	36.00
Gas carbon black	1.75	109.4 @ .20	21.90

It will be found that the cost of certain blacks per cubic foot is less than that of zinc oxide, lead oxide, magnesium oxide, iron oxide, and golden antimony.

METHODS FOR INCORPORATING BLACK PIGMENTS

The methods for incorporating gas black in rubber compounds depend upon the preparation of a "master-mix" for the purpose of removing the air from the black fluffy powder. William Geer of The B. F. Goodrich Company in 1917 obtained a United States

[1] This article may not be reprinted without permission of the author, who reserves all publication rights.

patent[3] for the use of kerosene in connection with gas blacks. The materials which can be used to advantage in preparing a master-mix are:

1. Pine rosin
2. Petrolatum
3. Washed and dried rubber
4. Cylinder oil
5. Paraffine wax
6. Reclaimed rubber

Other reasons for preparing these master-mixes in advance of the actual rubber compounding operation are: to reduce the time required to incorporate the powder; keep the main factory mixing room in clean condition; and insure uniform distribution of the gas black in the batch.

The use of gas black produces tire compounds having a relatively low specific gravity; high tensile strength; high elongation; low permanent set; and high speed of vulcanization.

PROPORTIONS TO BE USED

In compounding rubber for auto tire treads certain carbon blacks have been used in quantities as high as 20 per cent of the total batch, but 15, 10 and 5 per cent are the quantities used in most instances for tread stocks. Five per cent in this case would mean, for example, five pounds of carbon black in a total batch of 100 pounds. In the manufacture of high-grade black steam packings it can be used to advantage in amounts up to 15 per cent. In other types of mechanical rubber goods such as railroad steam hose, belting for power transmission, and conveyor belting, blacks can likewise be used to advantage in replacing fillers of high specific gravity.

SPECIAL MIXTURES. One of the more interesting experiments, for example, carried out in connection with the present investigation of carbon blacks had for its aim the preparation of a compound which could serve several purposes at one and the same time. It was, for example, found possible to produce a mixture which was quite tacky and at the same time possessed good lubricating qualities.

ANALYTICAL DATA

The laboratory information which is of interest and importance when deciding on the use of these materials for rubber compounding includes figures on:

1. Hygroscopicity.
2. Moisture content of the material as delivered.
3. Non-volatile mineral matter.
4. Acetone-soluble matter.
5. Fineness of the particles under microscope.
6. Specific gravity.
7. Cost of the material per cubic foot, based on its specific gravity.
8. Tinting strength or coloring power.

EXPERIMENTAL DATA

In order to determine the influence of gas black on the physical properties of rubber several compounds were prepared, vulcanized and tested. The results of these experiments are recorded below:

EXPERIMENT 1. A compound was prepared containing—

Rubber (plantation smoked sheets)	90.
Carbon black	1.0
Sulphur	9.0

Vulcanize at 287 degrees F. for 165 minutes.
Tensile strength of compound, 2725 pounds.
Elongation, from 1 to 9.1 inches.
Permanent set, 1 to 1.10 inches.

EXPERIMENT 2. A compound was prepared containing—

Rubber	85.5
Gas black	6.0
Sulphur	8.5

Vulcanize at 287 degrees F. for 180 minutes.
Tensile strength of compound, 2900 pounds.
Elongation, from 1 to 8.3 inches.
Permanent set, 1 to 1.14 inches.

EXPERIMENT 3. A compound was prepared containing—

Rubber	77.5
Gas black	15.0
Sulphur	7.5

Vulcanize at 287 degrees F. for 180 minutes.
Tensile strength of compound, 3260 pounds.
Elongation, from 1 to 7.6 inches.
Permanent set, 1 to 1.22 inches.

EXPERIMENT 4. A compound was prepared containing—

Rubber	61.0
Gas black	33.0
Sulphur	6.0

Vulcanize at 287 degrees F. for 165 minutes.
Tensile strength of compound, 3750 pounds.
Elongation, from 1 to 5.5 inches.
Permanent set, 1 to 1.4 inches.

This compound showed a greater tensile strength than all other mixtures which were tested. Almost equal results were obtained with a mixture containing 200 ounces of rubber plus 100 ounces of gas black.

EXPERIMENT 5. When zinc oxide was used in place of gas black, the greatest tensile was observed in a compound containing—

Rubber	56.0
Zinc oxide	37.0
Sulphur	5.0

Tensile strength of compound, 3300 pounds.
Elongation, from 1 to 7.0 inches.

REFERENCES

The following articles published in THE INDIA RUBBER WORLD, and pertaining to carbon blacks and colloid chemistry, are interesting for collateral reading: W. B. Wiegand, October 1, 1920, page 21; H. F. Schippel, January 1, 1920, page 208; E. B. Spear, September 1, 1920, page 809; G. L. Cabot, September 1, 1920, page 810.

In the *Journal of Industrial and Engineering Chemistry*: G. S. Perrott and R. Thiessen, April 1, 1920, page 324, contributed from the United States Bureau of Mines, Pittsburgh, Pennsylvania.

PART 2. THE REFINED HYDROCARBONS

MINERAL OILS, FATS AND WAXES. These materials are characterized by the fact that they are all "unsaponifiable" because they are derived or prepared from petroleum and other mineral products. In general it may be said that a "paraffine base" petroleum will yield solid hydrocarbons of the paraffine series, and the "asphalt base" oils are rich in asphalt, but contain no solid paraffines. Hydrocarbons of the olefine series are present in petroleums in small amounts.

LUBRICATING OILS. When the original crude oil is distilled there is a residue of about 12 per cent, which is known as tar. It has a specific gravity of about 0.9250 and contains lubricating oil as well as wax. The oil is separated from the wax by refrigeration, and purified by washing and distillation. Finally an oil of about "28 Baumé" is obtained. With a specific gravity of 0.886 this is also a low-viscosity lubricating oil. Cylinder oil and spindle oil are much heavier in body and have a high "fire test," flash 260 to 320 degrees C., high viscosity (100 to 230 seconds at 100 degrees C.), and low "cold test," because of the way in which they are for the most part employed.

PETROLATUM is a substance resembling in a measure the greases obtained from plants. It is made from selected crude oils by careful reduction and finally, filtration through fullers' earth or bone black. Reduced oils are obtained by driving off or distilling off the light fractions of the crude petroleum without cracking. Instead of heating them by direct fire they are distilled by the aid of a vacuum and by superheated steam. Petrolatum or vaseline has been used in rubber works for softening certain gums. For example, when Pontianak is washed and dried and then cooled, it appears as a rather brittle mass, but the last parts of the water are removed with some difficulty when treating large quantities. The conversion of the ponti into a plastic mass which can be weighed off conveniently in the compounding room, is the most desired thing. To this end it is mixed with a fixed per-

[3]United States patent No. 1,245,700.

centage of petrolatum in steam-jacketed kettles or in kettles over a direct fire.

PARAFFINE WAX. This can be had in a variety of "melting points" between 50 degrees C. and 60 degrees C. (122 and 140 degrees F.). Its melting point will naturally depend upon the amount of volatile oils it contains. So we find that paraffine wax which has been reheated several times gradually becomes harder, owing to the fact that some of the volatile matter has been driven off. This wax has been in use for many years as a compounding material and in many cases performed the work and accomplished the results now obtained by the use of pitches. It filled the minute interstices in the rubber dough and for that reason the products which contained it withstood the action of air in a very satisfactory manner. It has also been used for waxing the outer surfaces of finished rubber products to protect them from the action of air. This applies to steam packings as well as to auto tires. Paraffine wax is also useful in compounds which must pass through the tubing machine, as it acts as a lubricant and imparts a fine surface finish to the extruded product.

OZOKERITE. The principal deposit of ozokerite occurs near Boryslaw in Galicia, Austria. It consists essentially of paraffine hydrocarbons. The color of the crude material varies from yellow to black. The specific gravity varies from 0.850 to 0.890 and the melting point, according to Boverton Redwood, varies from 130 to 160 degrees C. (266 to 320 degrees F.). Owing to its specific gravity it may be freed from loose clinging mineral matter by heating in water. Ceresin is merely refined ozokerite. Two methods have been proposed for its preparation. The one is to extract the crude ozokerite with gasoline, filter and then distil off the gasoline. The other is to wash the crude ore with sulphuric acid, as is done in the case of petroleum hydrocarbons.

MONTAN WAX is obtained in Saxony, Silesia and Germany by extraction of the lignites with volatile solvents. Brown coal or lignite is a mineral related to bituminous coal on the one hand and wood on the other. Various substances have been extracted from it by destructive distillation. Montan wax is one of these. It has a specific gravity of about 0.950 and a melting point above 70 degrees C. (158 degrees F.). This material as well as ozokerite has been used to a considerable extent in Europe, in general for insulating compounds and in particular for compounds used on rubber-covered wire.

THE ACTION OF CERTAIN ORGANIC ACCELERATORS IN THE VULCANIZATION OF RUBBER—III[1]

By G. D. Kratz, A. H. Flower and B. J. Shapiro[2]

IT has for some time been generally recognized that although aniline is effective as an accelerator in the absence of zinc oxide, diphenylthiourea functions but mildly in the absence of, and strongly in the presence of this substance. Reference to this effect has already been made indirectly in the literature several times, and recently Twiss[3] has given curves for physical test results which demonstrate quite clearly the effectiveness of diphenylthiourea as an accelerator in the presence of zinc oxide. His statement that diphenylthiourea is practically inert in the absence of zinc oxide is, however, not in accord with our findings.

In a previous paper of this series[4] we have shown that in the acceleration of the vulcanization of a rubber-sulphur mixture, the activity of one molecular part of diphenylthiourea is less than that of an equimolecular quantity of aniline, but equal to that of one molecular part of aniline and one molecular part of phenyl mustard oil.

Our former experiments, however, were confined to the determination of sulphur coefficients at one cure only. In the present instance, we desired to compare the relative effects of aniline and diphenylthiourea over a series of cures, and to effect this comparison both by means of the sulphur coefficients and the physical properties of the various mixtures and cures. Further, it was desired to compare mixtures which contained zinc oxide, as well as the rubber-sulphur mixtures previously employed.

Summarizing our results briefly, we found that, in a rubber-sulphur mixture, the accelerating effect of aniline is considerably greater than that of diphenylthiourea, when judged either by sulphur coefficients or on the basis of the physical properties of the vulcanized mixtures. In mixtures which contained zinc oxide, however, the reverse was found to be true, and diphenylthiourea was more active than aniline when judged by either of the above criteria. It was also evident that in the case of the mixtures which contained zinc oxide, although the tensile strength of the mixture which was accelerated by diphenylthiourea increased more rapidly than in the case of the mixture accelerated by aniline, the same maximum tensile strength was attained by each. The sulphur coefficients at their respective maxima were practically identical. While the maximum tensile strength of the rubber-sulphur mixture which was accelerated by aniline was the same as that obtained when zinc oxide was present in the mixture, it was attained only at a much higher sulphur coefficient. Lastly, it was also found that the tensile strengths of the mixtures that contained zinc oxide and which were accelerated by either aniline or diphenylthiourea, particularly the latter, were increased tremendously during the first part of the vulcanization, and at very low sulphur coefficients. This would indicate the possibility of certain substances (accelerators) increasing the physical properties of a vulcanized mixture without greatly affecting the sulphur coefficient.

This point is of interest as it already has been noted by ourselves,[5] Cranor,[6] and others, that with mixtures which contain zinc oxide and a strong organic accelerator, the correct (or optimum) cure is obtained at abnormally low sulphur coefficients when compared with those obtained for unaccelerated mixtures. No explanation has been offered for this phenomenon. Bedford and Scott,[7] however, regard diphenylthiourea as the aniline salt of phenyldithiocarbamic acid after H_2S has been liberated. This salt is extremely unstable, owing to the weakly basic properties of aniline, and in this respect, according to Krulla,[8] is unlike the metallic salts of the same acid. In this connection, it is particularly pertinent to note that Bruni[9] has recently found the zinc salts of the mono and disubstituted dithiocarbamic acids to be violent accelerators. It is quite possible, then, that such a salt may be formed during the vulcanization process in mixtures which contain both diphenylthiourea and zinc oxide;[10] and that, irrespective of its action as an accelerator, the zinc portion of such a salt may be responsible for the physical improvement imparted to the mixture.

Our present results, moreover, particularly when interpreted with the assistance of the excess sulphur coefficients obtained for the various mixtures at different times of cure, show that when aniline is employed as the accelerator in the presence of zinc oxide, the effect of the latter substance is manifested almost entirely in the physical properties of the mixture. When aniline is replaced by diphenylthiourea the reverse is true, and the activity of the original substance as an accelerator is greatly increased when measured by either the sulphur coefficients or physical properties. In the latter instance, then, the zinc oxide most probably either assists in the decomposition of the diphenylthiourea

[1] Presented before the Rubber Division of the American Chemical Society, Chicago, Ill., September 6 to 10, 1920.
[2] The Falls Rubber Co., Cuyahoga Falls, Ohio.
[3] Journal of the Society of Chemical Industry, 39, 1920, 125t.
[4] Journal of Industrial and Engineering Chemistry, 12, 1920, 317.
[5] Journal of Industrial and Engineering Chemistry, 11, 1919, 30; Chemical & Metallurgical Engineering, 20, 1919, 418.
[6] The India Rubber World, 61, 1919, 167.
[7] Journal of Industrial and Engineering Chemistry, 12, 1920, 31.
[8] Ber., 46, 2669.
[9] British patents Nos. 140,387 and 140,388.
[10] The action of diphenylthiourea with zinc oxide is apparently similar to the action of the natural accelerator with magnesium oxide, as pointed out in a previous paper (Journal of Industrial and Engineering Chemistry, 12, 1920, 971). In both cases the oxide serves in a contributory capacity rather than as a primary accelerator. It is obvious that no one oxide will activate all accelerators equally well.

to a more active substance, or combines with the decomposition or alteration products of the original substance with the formation of a zinc salt, which is responsible for the increase both in the sulphur coefficients and tensile strength of the mixture. Our results with aniline as the accelerator, however, do not indicate the formation of such a salt.

Thus, in the presence of zinc oxide, the activity of aniline and diphenylthiourea as accelerators appears to be of a different nature. Evidently, an acid substance, probably a thiocarbamic acid, capable of reacting with zinc oxide, is formed as one of the decomposition products of diphenylthiourea. The excess accelerating activity is attributed to this zinc salt. When aniline is employed as the accelerator, there is no evidence of such salt formation.

TABLE II

(All Mixtures Vulcanized at 141.5° C.)

Cure in Minutes	Mixture A			Mixture B			Mixture C			Mixture D			Mixture B-I			Mixture D-I		
	Sulphur Coefficient	Tensile Strength, lbs. per sq. in. at Break	Final Length at Break Per Cent	Sulphur Coefficient	Tensile Strength, lbs. per sq. in. at Break	Final Length at Break Per Cent	Sulphur Coefficient	Tensile Strength, lbs. per sq. in. at Break	Final Length at Break Per Cent	Sulphur Coefficient	Tensile Strength, lbs. per sq. in. at Break	Final Length at Break Per Cent	Sulphur Coefficient	Tensile Strength, lbs. per sq. in. at Break	Final Length at Break Per Cent	Sulphur Coefficient	Tensile Strength, lbs. per sq. in. at Break	Final Length at Break Per Cent
30	0.794	....	....	1.126	545	1180	1.005	....	....	1.434	540	710	0.913	[1]	1210	1.603	2210	820
45	0.856	279	1250	1.317	1019	1170	1.055	306	680	1.490	1366	770	1.063	[1]	1360	1.912	2381	780
60	1.038	....	....	1.583	1228	1120	1.207	592	750	1.838	1819	770	1.335	[1]	1260	2.297	2442	790
75	1.090	494	1220	1.898	....	....	....	....	....	....	1968	750	1.609	533	1230	2.623	....	....
90	1.531	709	1150	2.482	1621	1060	1.558	1041	760	2.382	2350	720	1.953	789	1230	2.962	2730	830
120	2.089	871	1180	3.351	2046	1100	1.765	1815	780	2.801	2808	780	2.496	1053	1210	3.755	2699	770
150	2.236	1159	1130	4.033	2410	1100	2.237	1950	760	3.266	2721	770	3.109	1303	1150	4.521	2619	750
180	2.470	1521	1130	4.939	2670	1030	2.620	2032	750	4.226	2663	740	4.027	1779	1110	5.357	2020	690
210	3.179	1842	1100	5.264	2566	970	3.340	2184	760	4.806	2245	700	4.730	2021	1080	6.379	1118	530
240	3.751	2124	1060	6.268	2131	910	3.615	1978	730	5.564	1837	660	5.624	2362	1050	7.079	754	440

[1] Test pieces did not break.

EXPERIMENTAL PART

The present experiments were designed to effect a comparison of the sulphur coefficients and physical properties of representative mixtures when accelerated by 0.01-gram-molecular quantities of either aniline or diphenylthiourea. The six following mixtures were employed for this purpose, and each was vulcanized for a series of cures:

A—Rubber-sulphur control
B—Rubber, sulphur, and aniline
B-I—Rubber, sulphur, and diphenylthiourea
C—Rubber, sulphur, and zinc oxide control
D—Rubber, sulphur, zinc oxide, and aniline
D-I—Rubber, sulphur, zinc oxide, and diphenylthiourea

The quantities of each substance employed in these mixtures are shown in Table I. The amounts of aniline or diphenylthiourea

TABLE I

Ingredient	Mixture A	Mixture B	Mixture C	Mixture D	Mixture B-I	Mixture D-I
Rubber	100.00	100.00	100.00	100.00	100.00	100.00
Zinc oxide	....	....	100.00	100.00	....	100.00
Sulphur	8.1	8.1	8.1	8.1	8.1	8.1
Aniline	....	0.93	....	0.93	....	....
Diphenylthiourea	....	....	....	....	2.28	2.28

added to these respective mixtures represent 0.01 gram-molecule of the accelerator for each 100 gms. of rubber in the mixture. Otherwise, the same general method of procedure was adopted in the course of this work as in that previously reported in Part I.[11]

The rubber used was of good quality, first latex, pale crêpe, a different sample of the lot used in our former experiments. The various mixtures were mixed on the mill, vulcanized, and tested in the same manner as before. The physical properties of the vulcanized samples were determined on a Scott testing machine of the vertical type, with the jaws opening at the rate of 20 inches per minute. A recovery period of 48 hours was allowed before physical tests were made. Combined sulphur was estimated by our method previously reported in detail.[12]

The various mixtures were vulcanized at 141.5 degrees C. for different intervals of time up to 240 minutes.[13] The sulphur coefficients and physical properties of the different cures for each mixture were determined. These results are given in detail in Table II. Generally speaking, the results obtained were in good agreement, and fairly smooth curves for physical properties were obtained.[14]

CONCLUSIONS

(1) In a rubber-sulphur mixture, the activity of aniline in the acceleration of vulcanization is much greater than that of a molecularly equivalent quantity of diphenylthiourea.

(2) In mixtures which contain zinc oxide, diphenylthiourea is more active than aniline.

(3) In mixtures accelerated by aniline, either with or without zinc oxide, the same maximum tensile strength is obtained, accompanied by a higher sulphur coefficient in the absence of zinc oxide than when this substance is present.

(4) Mixtures which contain zinc oxide, and which are accelerated by either aniline or diphenylthiourea, show large increases in tensile strength in the early stages of the vulcanization.

(5) Mixtures which contain zinc oxide and which are accelerated by either aniline or diphenylthiourea, attain the same maximum tensile strength at approximately the same sulphur coefficients.

(6) There is apparently no general relation between the physical properties and sulphur coefficients of accelerated mixtures.

[11] Journal of Industrial and Engineering Chemistry, 12, 1920, 317.
[12] The India Rubber World, 61, 1920, 356.
[13] In the experiments described in Parts I and II vulcanization was carried on at a temperature of 148 degrees C.
[14] Satisfactory physical test results for representation graphically are obtainable with considerable difficulty. We have found it necessary, particularly when seeking results for stress-strain diagrams, to employ three men, one to operate the machine and two to take readings.

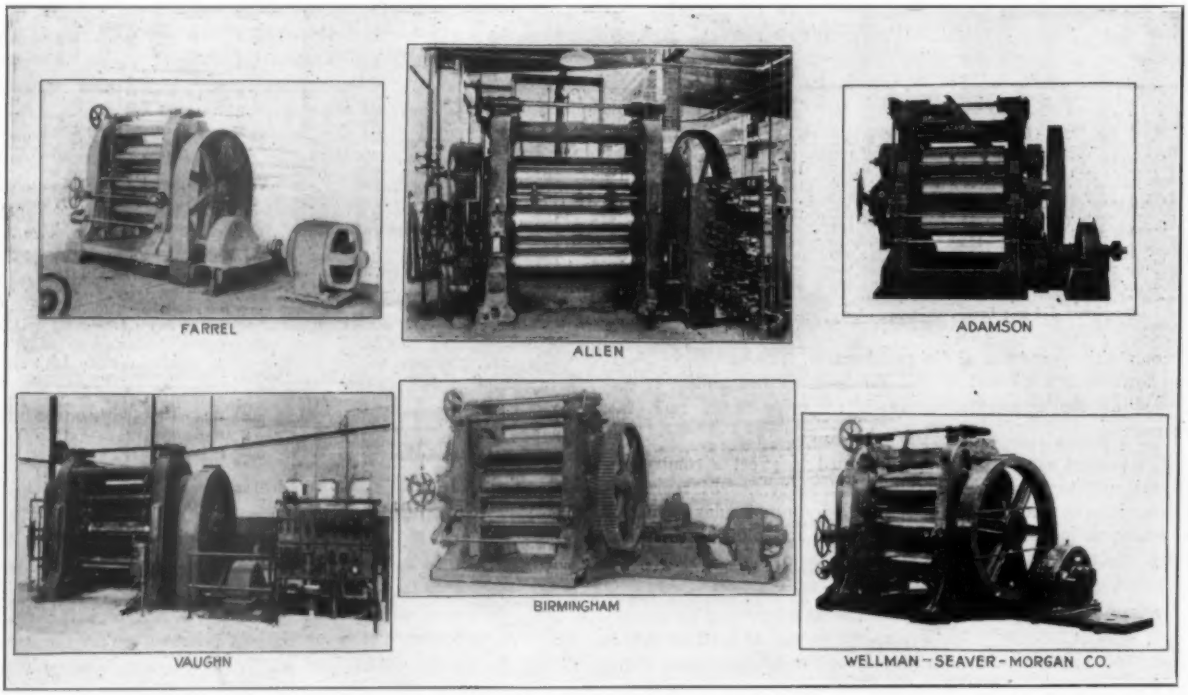
SHIPPING SERVICE TO RHINE POINTS RESUMED

The Red Star Line of the International Mercantile Marine Co., New York, N. Y., announces resumption of its pre-war all-water service to points on the River Rhine. Transhipment via fast Antwerp steamers may be made for both incoming and outgoing traffic. Through rates will now be named and through bills of lading issued. Goods for France, Alsace-Lorraine and the district of the Saar may be shipped via Strasburg without asssessment of the French Customs surtax. Rates will also be named for rail shipments via Antwerp and Thionville to and from the Rhine Valley, Switzerland, France and inland points in Belgium for handling classes of cargo requiring rail transportation. This restores Antwerp as a shipping point for the territory in question to the same favorable position it held before the war.

New Machines and Appliances

STANDARD TIRE CALENDERS

STANDARD calenders employed in the tire-manufacturing industry are massive machines of the 24 by 66-inch, 3-roll type, equipped with electric motor-drive and control. Tire calenders are operated on "friction" by variation in the relative speeds of the middle and bottom rolls whereby the fabric structure is filled with rubber, or on "even motion," that is, with rolls revolving at the same speed producing a smooth sheet of rubber which may be directly applied as a "skim" coating on fabric already "frictioned" or delivered of thicker gage for independent use for inner tubes, side-walls, etc.



STANDARD TYPES OF 24 BY 66-INCH 3-ROLL TIRE CALENDERS

Preliminary to the calendering operation the rubber compound is warmed up on a mill and the calender rolls are heated to a temperature suitable for the compound which is then fed into the calender between the top and middle rolls. The feed-slide is known as the front of the calender.

FRICTIONING FABRICS

The term "frictioning" designates the process of impregnating a fabric by filling its meshes from one or both sides with rubber or composition. This effect results from a variation in the relative speeds of the middle and bottom rolls by which the rubber on the middle roll is made to revolve as a "bank" against the surface of the fabric passing through at the speed of the bottom roll. This difference in speed forces the rubber through the meshes of the fabric while the surface of the goods also gains a light coating of rubber.

The operation of frictioning is conducted as follows: The middle or drive roll is covered with a heavy coating of warmed rubber. A roll of fabric is placed in the brake-brackets at the rear of the machine and passes through the calender between the middle and bottom rolls. These rolls are adjusted with suitable interval between, to "bank" the rubber against the bottom roll. It is this revolving bank of rubber which forces the rubber into the fabric as it passes. The first friction coat practically goes entirely through the weave of the fabric and, therefore, comprises more than half the rubber applied to a fabric frictioned on both sides. After each passage through the calender the goods are rolled on a stock-shell set in the "take-up" device on the front of the machine. When coating the second side, it is necessary to wind the double-coated fabric in a liner of plain cotton sheeting to separate the tacky rubber surfaces and prevent their adhering and making the roll solid.

In friction-coating, the surface speed of the bottom roll is about 30 per cent slower than that of the middle or drive-roll to gain difference in speed for the frictioning effect.

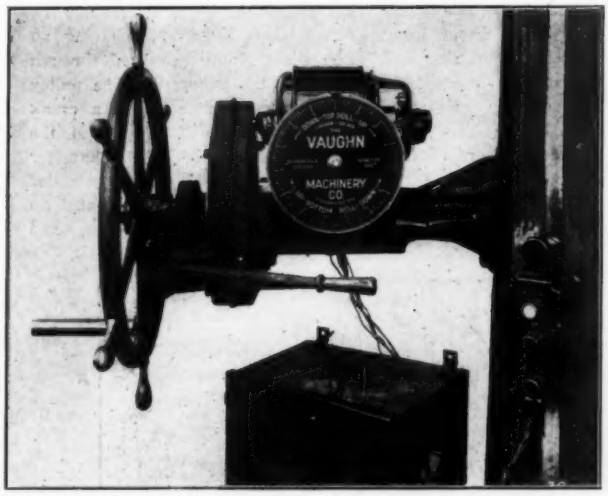
SKIM-COATING AND SHEETING

Skimming consists of laying a very thin coat or sheet of rubber on one side of the frictioned fabric to give it a smooth finish and build it up to a specified gage or thickness. This is done by passing the frictioned fabric through the calender between the middle and bottom rolls as for friction coating. In skim coating the speeds of all the rolls are the same. This condition is designated as "even motion." Thus arranged a calender will produce smooth rubber sheets of any desired thickness according to adjustment apart of the middle and bottom rolls. Arranged on even motion a calender is ready for building up to specified gage pure rubber for inner-tubes, side-walls or any other purpose requiring a smooth sheet.

MOTOR-POWER ROLL ADJUSTMENT FOR CALENDERS

Calender rolls are adjusted in relation to the intervals between them, by an arrangement of screws and gearing actuated by a hand-wheel, but a motor-driven mechanism provided with a fine indicator for effecting the roll adjustment is preferable. The accompanying illustration shows a special attachment designed for very close adjustment of the middle and bottom rolls necessary in running sheet stock to accurate gages. This mechanism is driven by a 24-h.p. motor through a cone friction clutch. A small lever at the right operates the clutch connecting the driving shaft to either upper or lower roll adjustment as desired. The large lever at the left operates a clutch which connects the drive-shaft to either motor or hand-wheel. The hand-wheel is retained as an emergency means for operating the roll adjustment if the motor should be out of service.

The motor controller is of the automatic type operated by three push buttons which are marked "Up," "Down" and "Stop."



VAUGHN ELECTRICALLY-DRIVEN CALENDER-ROLL ADJUSTER

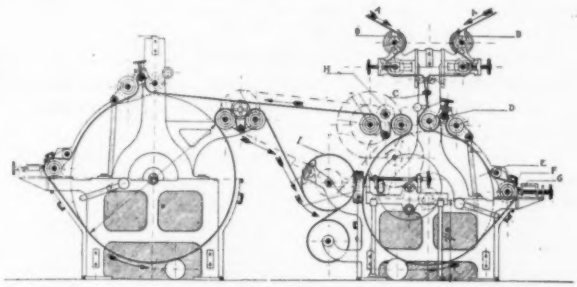
To operate the mechanism the clutch lever at the left is pulled down, thereby connecting the motor to the driving shaft. The small lever at the right is placed in the proper position for driving the upper or lower rolls as desired and the adjustment then made by pushing the proper buttons of the control. The movement of the rolls is very accurately shown by the large dial, it being easily possible to estimate a movement of one-half of one one-thousandth of an inch.

It is possible to reset the pointer on the dial at any time so that the movement of the rolls from that point can be read directly. The control for the motor is very positive so that it is possible to make accurate and small adjustments as well as larger ones. The friction drive is designed so that it will slip before the rolls are injured, should the motor be left running after they have come together.

CONTINUOUS CORD-TIRE FABRIC MACHINE

A novel machine of French design and manufacture for producing rubberized cord tire fabric without woof threads is shown in cross-section in the accompanying illustration. The course of the fabric in the making is indicated by the heavy line and arrows.

Beginning at *A* and *A'* in the figure, two chains of parallel threads of indefinite length and a width equal to that of the fabric enter the mechanism from overhead on either side of the machine. The threads of each of these chains successively alternate with the threads of the other and are then stuck together with rubber composition to make a "woofless" fabric. The proper distribution or laying together of the threads is done by threading them through combs as guides at points *B*, *B'* and *C*.



THE BOURDIN CORD FABRIC MACHINE

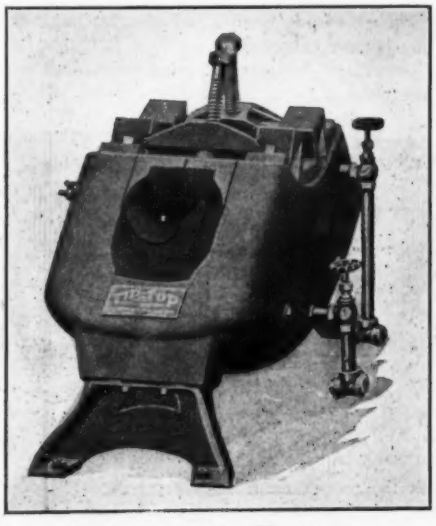
The first coating of rubber is applied at the group of water-cooled rollers *D* from which the fabric passes on in contact with the steam-heated cylinder *E*.

It then passes on to be again coated over the water-cooled roller *F* by a knife *G* the variable slope of which permits regulation of the coating. Continuing on around the drying cylinder *E* the fabric reaches the water-cooled roller *H*. From this point the other side of the fabric is similarly coated and dried in a second section of the machine. The finished fabric coated on both sides is finally wound up at *I* with a cloth liner to prevent adhesion.—Manufactured by A. Olier, 10 rue Beaurepaire, Paris, France; agents, L. J. Broche and F. Chassaing, 21 rue de la Station, Alfort (Seine), France.

AKRON RUBBERMOLD TRUCK-TIRE VULCANIZER

The Akron Rubber Mold & Machine Co., Akron, Ohio, builds a complete line of vulcanizer equipment for tire repair, including giant pneumatic truck-tire molds for 6, 7, 8, 9 and 10-inch cord tires in both flat and round tread.

The improved Type A mold has been redesigned to accommodate cord tires as well as fabric tires. This is a three-cavity outfit,



AKRON RUBBERMOLD VULCANIZER

with self-contained steam boiler, tube plate and inside patch vulcanizer attachment. Type F equipment is designed to accommodate fabric tires only. Type F is a two-cavity outfit with self-con-

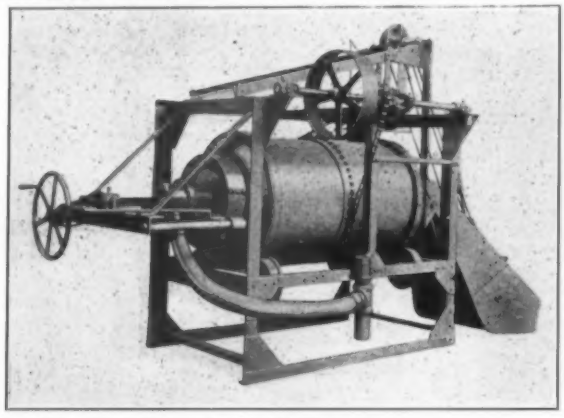
tained steam boiler, tube plate and inside patch vulcanizer attachment.

Another popular equipment is the improved Type E cavity retreading vulcanizer. This model will accommodate all makes of tires from 3-inch to 5-inch cord and fabric tires. It is a self-contained outfit.

"IDEAL" TUMBLING BARRELS

The promptness with which machines employed in other industries are adapted by rubber engineers for their special use is characteristic of the industry.

The cement mixer shown in the accompanying illustration is offered as a suggestion having possibilities as a tumbler for small



A TIME-SAVING TUMBLING BARREL.

molded rubber articles because of its automatic loading and emptying features that save a great deal of labor.

The machine may be loaded and unloaded while in motion, and the time required for either of these operations is but a fraction of the time required by the old customary form of tumbling barrel.—Ideal Concrete Machinery Co., Cincinnati, Ohio.

SIFTING REEL FOR DRY COMPOUNDING INGREDIENTS

The practice of sifting compounding ingredients before adding them to the rubber mixing requires an effective mechanism that will not easily became deranged.

A special centrifugal reel for removing mechanical impurities, shown in the accompanying illustration, consists of a cylinder

CENTRIFUGAL SIFTING REEL

covered with the proper mesh cloth revolving at a slow speed. The material entering the machine is picked up by beaters attached to spiders fastened to a higher speed shaft and thrown against the screen cloth, which rejects the lumps and impurities, leaving the sifted product free from the injurious material. The cloth cylinder is provided with a revolving brush to keep the meshes of the cloth from filling up. The product passing through the cloth drops onto zinc-covered cant boards and thence into the conveyor at the bottom of the machine to be delivered to an opening at one end of the box.

As it is necessary to maintain a steady, even stream of material to the reel a feeder, not shown in the illustration, is employed which can be regulated to deliver a uniform amount to the machine.

These reels are in successful operation in several of the leading tire plants.—Allis-Chalmers Manufacturing Co., Milwaukee, Wisconsin.

MACHINERY PATENTS

MACHINE FOR MAKING TIRE CASINGS

THE apparatus shown in Fig. 1 is used for making the fabric foundation of a tire casing. A fabric strip formed of parallel rubber-coated cords, is wound obliquely about spaced wires *A* mounted over pairs of grooved pulleys *B*. The strip is led from a drum to reels *C* projecting from a frame, which embraces the wires *A*. The frame itself is rotated by bevel gearing *D*. It is rocked about its supporting shaft by a cam, having an adjustable connecting rod. The wires *A* are advanced through the frame by intermittent rotation of the pulley *E*. The pulley is actuated by one-way clutch members, connected to a crank disk. Between the advancing movements of the wires *A* the superposed layers of fabric are consolidated between a hammer *F* and an anvil impelled by tappet mechanism. The tension roller *G* is arranged in the lower run of the wires and is mounted on a block having an adjustable spring which fits between a fixed bracket and a hand-wheel on the stem of the block.

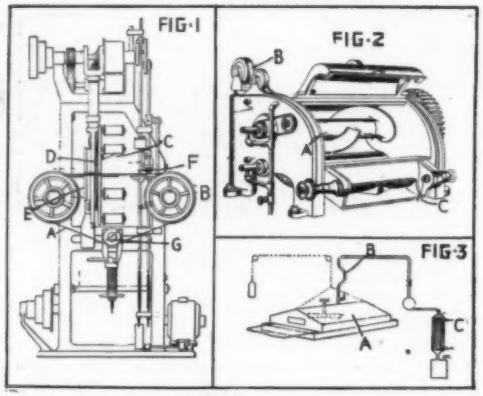


FIG. 1. TIRE CASING MACHINE—FIG. 2. AUTOMATIC ENCLOSED MIXER—FIG. 3. SOLVENT-RECOVERY APPARATUS.

A hand-operated ramp is used for lifting the tension roller out of action, and for varying the spacing of the wires the pulleys *B* are threaded on the bosses of the pulleys *E*. A spacing plate is arranged between the wires.—British patent No. 150,717.—A. Wolber, Levallois-Perret, Seine, France.

AUTOMATIC MACHINE FOR MIXING RUBBER

The mixer shown in Fig. 2 consists of a cylindrical casing containing a rotary member *A* mounted in bearings and provided with two or more helical blades of opposite twist, with gaps left between the ends of the blades. Thus the material is forced along towards the end of the chamber, then passes through a gap and is forced by the other blade to the other end of the chamber, and so on. Each of the blades has its edge beveled, so that the mixture which is forced outwards by the surfaces of the blades, is smeared against the inner surface of the chamber.

The mixing chamber and the interior of the rotatable member may be heated or cooled by steam or water supplied through pipes. The door of the mixing chamber hinges at the bottom

and is closed by a fluid-pressure cylinder, the piston of which is connected to the door by a flexible member *B*.

The ingredients to be mixed with the rubber are contained in a drum, mounted on revoluble members indicated by *C* in the recess of the door. In use, a filled drum is placed in position and the door closed. When the pigments are to be introduced into the mixing chamber, the ends of the drum are removed and the contents allowed to pass into the chamber. The eccentric mounting of the drum assists in shaking out the material.—British patent No. 150,269.—A. P. Lohmann, Akron, Ohio.

APPARATUS FOR RECOVERING VOLATILE SOLVENTS

This machine is shown in Fig. 3, in greatly reduced proportions. The rubber material under treatment is covered with a closely fitting hood, through which air is drawn. The air within the hood is agitated by a fan in order to improve its evaporating efficiency, and then passes to a condenser. The hood *A*, in which the fan is mounted, has a counterpoise, so that it can be easily raised. The air is withdrawn through a flexible tube *B* provided with a cut-off valve connected to the starting lever of the machine. The air passing through the hood *A* to the condenser *C* may be compressed. The condenser tubes may be of circular cross section provided with hexagonal baffles, on a central rod, to collect the liquid.—British patent No. 141,210.—D. V. Plumbridge, Holmewood, South Kilworth, Warwickshire, England.

OTHER MACHINERY PATENTS

THE UNITED STATES

NO. 1,376,463 Air-bag for vulcanizing. I. K. Rystedt, Dayton, O.
1,376,579 Tire-casing-inspecting apparatus. E. Ramsdell, Cleveland, O.
1,377,133 Tire-repair vulcanizer. L. Jacobson, Chicago, Ill., assignor to G. B. Cooper, Cleveland, O.
1,377,212 Fabric-smoothing machine. R. McClenathen, Cuyahoga Falls, and J. Neall, Akron—both in Ohio, assignors to Kelly-Springfield Tire Co.
1,377,214 Steam connection for hollow tire-core. T. Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls—both in Massachusetts.
1,377,845 Machine for repairing clincher rims of vehicle wheels. L. C. McDonald, Page, Neb.
1,378,172 Apparatus for curing tire casings. F. J. Gostlin, assignor by direct and mesne assignments to The Star Rubber Co.—both of Akron, O.
1,378,678 Indented mold for tubes and tires. I. S. Hoffmann, Columbus, O.
1,379,169 Machine and method for inserting inner tubes into casings. N. D. Chellis, Erie, Pa.
1,379,203 Tire mold. C. P. Mundale, Seattle, Wash.
1,379,369 Tire-bead cementing apparatus. W. C. Stevens, assignor to the Firestone Tire & Rubber Co.—both of Akron, O.
1,379,391 Vulcanizing pad. F. A. Brown, assignor to the G. & J. Tire Co.—both of Indianapolis, Ind.
1,379,397 Vulcanizing air-bag for tire repair. O. W. Dolph, Los Angeles, California.
1,379,447 Repair vulcanizer. E. D. Hostler, I. J. Hamiel and C. H. Mather, all of Tipton, Ia., assignors of ½ to said Hamiel and ¼ to said Mather.
1,379,597 Selvage trimmer. R. S. Trogner, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

REISSUES

15,099 Wrapping-machine folder. W. C. Stevens, Akron, O., assignor to Pierce Wrapping Machine Co., Chicago, Ill. Original patent No. 1,196,044, dated August 29, 1916. Divided; original patent No. 1,243,357, dated October 16, 1917.

THE DOMINION OF CANADA

211,157 Apparatus for manufacturing high-pressure expanded vulcanized rubber. C. L. Marshall, London, Eng.
211,238 Tire-making machine. The Goodyear Tire & Rubber Co., assignee of W. B. Harsel, executor of estate of E. Nall, deceased—both of Akron, O.
211,239 Tire-making machine. The Goodyear Tire & Rubber Co., assignee of W. B. Harsel and E. A. Nall—all of Akron, O.
211,241 Rubber-slicing machine. The Goodyear Tire & Rubber Co., assignee of E. A. Nall, executrix of estate of E. Nall, deceased—both of Akron, O.
211,245 Tire-turning device. John Bertram & Sons Co., Limited, Dundas, Ont., assignee of F. Southwick, Kansas City, Kans., U. S. A.
211,297 Tire-repair vulcanizer. H. K. Wheelock and F. A. Weller, both of Los Angeles, and W. R. Fountain, Oakland—both in Calif., U. S. A., each assignee of ⅓ interest.
211,298 Tire-repair vulcanizer. H. K. Wheelock and F. A. Weller, both of Los Angeles, and W. R. Fountain, Oakland—both in Calif., U. S. A., each assignee of ⅓ interest.
211,627 Tire mold and clamp. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of H. V. Lough, Hartford, Conn., U. S. A.

NEW ZEALAND

43,358 Tire repair vulcanizer. W. M. Early, Wellington, N. Z.

THE UNITED KINGDOM

159,456 Tire inflater. L. Pickrell, 108 Church street, Edmonton, London.
159,630 Machine for winding balls of elastic thread on a core for making golf-balls, etc. C. H. Gray, India-Rubber, Gutta Percha & Telegraph Works Co., Silvertown, London, and J. Hubbard, 35 Norfolk Road, Seven Kings, Essex.
159,631 Tension device for elastic thread winding machine used in manufacture of golf balls. C. H. Gray, India-Rubber, Gutta Percha & Telegraph Works Co., Silvertown, London, and J. Hubbard, 35 Norfolk Road, Seven Kings, Essex.
159,993 Apparatus for filling rubber solution into rubber flasks for use as cores of golf balls. C. H. Gray, India-Rubber, Gutta Percha & Telegraph Works Co., Silvertown, London.
160,007 Machine for cutting cloth, sheet rubber, etc. W. Hamilton, Lindum street, Rusholme, Manchester.
160,032 Apparatus for making tires. Dunlop Rubber Co., Limited, Dunlop House, Albany street, Regent's Park, London, and C. Macbeth, Fort Dunlop, Erdington, Birmingham.
160,169 Apparatus for rolling freshly coagulated rubber. Société Anonyme Compagnie des Caoutchoucs de Padang, 7 rue des Italiens, Paris. (Not yet accepted.)
160,268 Apparatus for molding rubber for vulcanizing. A. Mond, 19 Southampton Buildings, Chancery Lane, London. (The Miller Rubber Co., Akron, Ohio, U. S. A.)
160,670 Apparatus for joining ends of solid rubber tires having an embedded helical wire core into the meeting ends of which a metal rod or pin is fitted. J. H. Bolwell, 421 Gloucester Road, Horfield, Bristol, and A. G. Barrett and J. C. Burton, Post Office Place, Leicester.
160,753 Door for autoclaves, etc. Naamlooze Vennootschap Hilversumsche Ijgergieterij en Machinefabriek voorheen Ensink & Co., Hilversum, Holland. (Not yet accepted.)
161,009 Device for repairing tire-treads. W. B. Burke, 215 St. Clair avenue, Cleveland, Ohio, U. S. A.

GERMANY

DESIGN PATENTS ISSUED, WITH DATES OF ISSUE

775,343 (October 31, 1919.) Apparatus for making impervious tubes by drenching tube fabric with a rubber solution. Fa. Wilhelm, Körting, Barmen.
775,391 (March 29, 1921.) Machine for stamping combs. Fa. Eduard Meek, Pforzheim.
775,567 (April 4, 1921.) Steam holder of metal for vulcanizing apparatus with riveted vulcanizing plate. Fleming & Cie., G. m. b. H., Charlottenburg.
775,863 (April 2, 1921.) Doubling knife for machine for cutting combs. Victor Müller, Forsthaus near Krefeld.

PROCESS PATENTS

THE UNITED STATES

NO. 1,377,729 Applying lubricant to tire casings. W. F. Ray, Chicago, Ill.
1,378,064. Forming dentists' molds in flexible cup and expanding sides of cup to remove. G. E. Terranova, New Haven, Conn.
1,378,523 Forming hollow rubber articles having relatively infusible insert bedded therein. F. A. Cigol, Paterson, N. J.
1,379,598 Air-bag and method of wrapping. R. S. Burdette, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

REISSUES

15,108 Manufacture of sponge rubber non-pneumatic balls. Kinsuke Fukuda, Tokio, Japan. Original No. 1,320,221, dated October 28, 1919.

THE DOMINION OF CANADA

211,240 Production of lampblack. The Goodyear Tire & Rubber Co., Akron, O., assignee of W. K. Lewis, Cambridge, Mass., U. S. A.
211,290 Manufacturing pneumatic-tire casings. E. Hopkinson, New York, N. Y., assignee of J. L. G. Dykes, Chicago, Ill.—both in U. S. A.
211,367 Producing tire armor of rubber and fabric. A. E. Jennings, Owensboro, Ky., U. S. A.
211,435 Manufacture of stretchless corded belting. The Lambert Multiplus Co., assignee of H. M. Lambert—both of Portland, Ore.
211,600 Manufacture of fabric tires. H. Stanyon, Toronto, Ont.
211,914 Vulcanization of rubber articles. The B. F. Goodrich Co., New York, N. Y., assignee of H. D. Ayres, Akron, O.—both in U. S. A.

THE UNITED KINGDOM

160,367 Manufacture of fabric tires. A. C. Schwartz, 2050 Woolworth Building, New York, New York, U. S. A.
161,156 Production of zinc oxide. New Jersey Zinc Co., 160 Front street, New York, N. Y., assignee of J. A. Singmaster, Palmerton, Pa.—both in U. S. A. (Not yet accepted.)

GERMANY

DESIGN PATENTS ISSUED, WITH DATES OF ISSUE

776,521 (March 3, 1921.) Method of stopping joints of rubber hose. Hermann Falk, Schweinfurt.

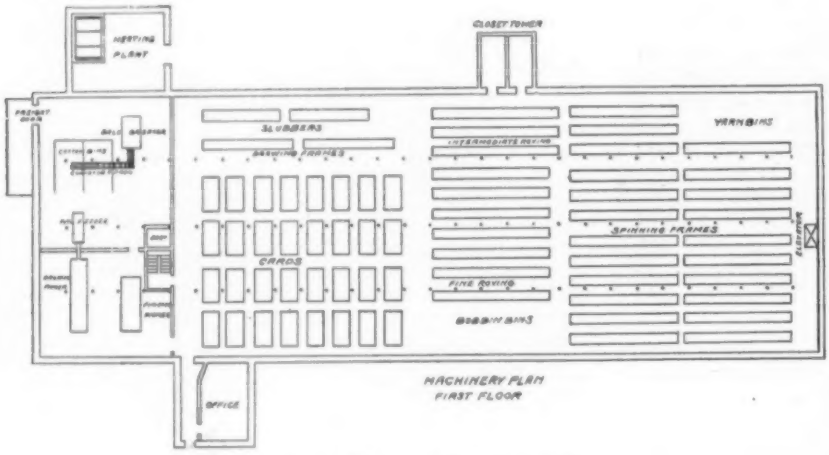
LUBRICATING TIRE MOLDS

A very convenient and satisfactory means of lubricating tire repair or other rubber molds is by means of a pad of cheese-cloth which has been well-saturated with melted cocoa butter and replaced with a fresh pad at frequent intervals.

The Planning of a Cotton Mill for Tire Fabrics

By G. Joseph Nord[1]

THERE is no iron-clad rule that can be laid down as to the proper design of a cotton mill manufacturing tire fabrics, as this is a comparatively new branch of the textile industry in which there has been a wide departure from the conventional methods in the manufacture of cotton goods. Each manufacturer or engineer usually has his own ideas as to the construction of the mill building, the type or make of machinery and its position in the mill.



FIRST-FLOOR PLAN OF A TIRE FABRIC MILL

To familiarize the reader with what is considered a practical lay-out of a modern tire fabric plant, I will give a description of a 5,000-spindle mill designed to produce 23 by 5 by 3-cord fabric and 23 by 23 builder fabric.

There are several important matters that should be carefully considered at the outset in connection with planning a cotton mill; some of these are the following:

1. The class of goods to be made.
2. The size of the mill, as determined by the number of spindles.
3. The machines necessary to be operated in connection with this number of spindles in order to produce the goods desired.
4. The space that this machinery will occupy.
5. The extra expense to be incurred in addition to the building and equipment of the mill—the land to be purchased, tenement houses to be erected, capital to be left for the operation of the mill, etc.
6. The total cost of the undertaking.

It is important, therefore, to plan each of the foregoing subjects and have specifications for them submitted to the proprietors or directors before commencing to plan the building.

MILL BUILDING

For a 5,000-spindle mill a two-story building about 80 feet wide and 250 feet long is most practical so as to eliminate as far as possible the use of artificial light.

The more recent designs of mill buildings are of reinforced concrete which are superior to the ordinary type of slow-burning construction. This type of building, if used with steel sash and doors, is ideal for cotton manufacturing, as it gives an abundance of light and an unyielding floor for machinery, the latter being a very important factor in keeping machines in line and thereby increasing their life and efficiency.

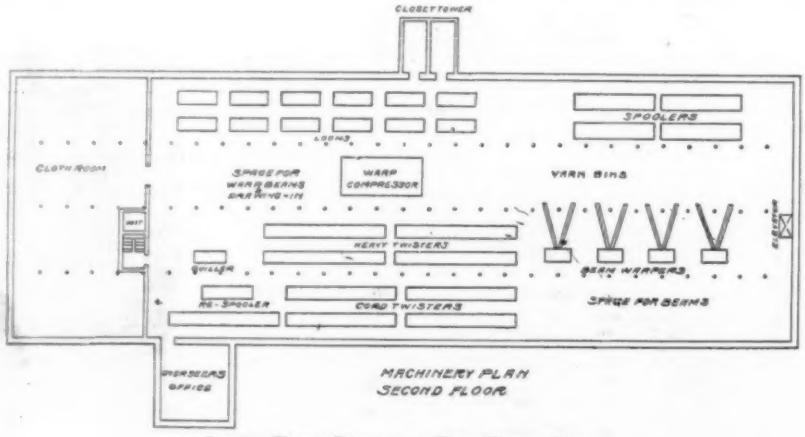
POWER, HEAT AND LIGHT

Electrical power is generally found to be more economical and the individual drive, being no longer an experiment on textile machinery, makes this form of drive the most practical and efficient.

A successful heating system for a textile mill must be constructed of the best of material and well put together. It must be elastic and easily controlled; have abundant reserve capacity; be compact, durable and easily accessible for repairs.

The condition of the atmosphere in regard to moisture or humidity is an important feature, and in addition to the necessary warmth, a certain amount of water must be carried in suspension in order that the materials in process may be in the proper condition. One of the most valuable improvements along this line during recent years has been the use of automatic regulation in connection with a humidifying apparatus. Uniform moisture at all times is an absolute necessity, and, of course, without automatic regulation this is not possible. Humidity not only saves a big loss in weight, but also makes better running work which in turn lessens the cost of production.

Electric lighting, of course, is the best system, and any good industrial lighting unit is suitable as long as care is taken so that there is no casting of shadows.



SECOND-FLOOR PLAN OF A TIRE FABRIC MILL

FIRE PREVENTION

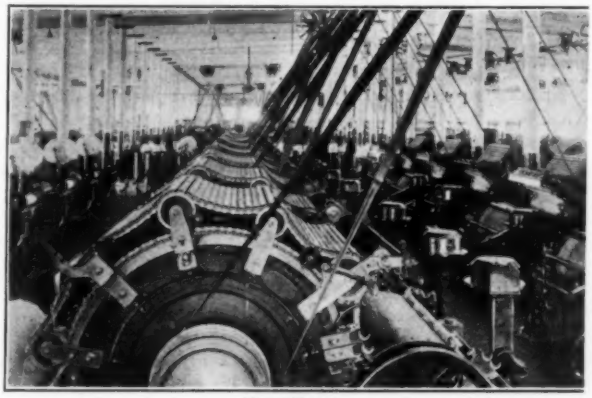
It is very important that a mill should be so constructed as to minimize the risk of fire, and so equipped that a fire may be extinguished at the earliest possible moment. At the present

[1] Consulting Textile Engineer, Columbus, Ohio, and Atlanta, Georgia.

time the prevention of fire in textile mills has been reduced to a science, and the number of serious fires in mills is only a small percentage of the number that formerly occurred. An approved sprinkler installation is an absolute necessity to the modern mill.

PLANNING THE MILL

To explain the method of planning the lay-out of a mill, a standard tire fabric mill for the production of carded cord and builder fabric will be taken as an illustration, and the details of



CARD ROOM

the machinery equipment worked out with reference to this particular type of mill. The size of the mill to be 5,000 spindles and to produce 4,000 pounds of cord fabric and 4,000 pounds of builder fabric.

The requirements here call for No. 23 cord yarn to be twisted 11 ply for both warp and filling and to be woven 23 sley (warp ends) and 23 picks to the inch for builder fabric. The cord fabric to be made of No. 23 yarn to be twisted five ply and cabled three ply and woven with 27 ends per inch of warp and single 23s filling and woven with 2½ picks per inch.

The counts or numbers of the yarn to be made in this case are already known as 23s; and for making this yarn the following machinery is required:

MACHINERY REQUIRED

PRODUCTION AND SCHEDULE OF PICKING AND CARDING MACHINERY

FOR BLANK COTTON MILLS COMPANY
Installment of 5020 Spindles.
Yarn No. 23. Warp. No. 23/5/3. Filling, August. No. 23.
Production. 8000 Lbs. of Goods per Week of 48 Hours.

No. of Machines	PICKING AND CARDING MACHINERY	Speeds	Pounds Per Spindle	Lbs. per Week, Total Production
1-40"	No. 4 Bale breaker	....	....	10,600
1-40"	2 Beater breaker lapper	....	....	10,182
1-40"	1 Beater finisher lapper	850	....	9,978
32-40"	Rev. flat cards 27" doffer 12" cans	165	300	9,379
16	Deliveries, 1st Drawing 6 into 12" cans	250	614	8,259
16	Deliveries, 2nd Drawing 6 into 12" cans	250	614	8,259
2	Slubbers, 12x6 bobbin 48 spindles = 96 sp.	600	110	
3	Inter. 10x5 bobbin 96 spindles = 288 sp.	800	31	
7	Fine 8x3½ bobbin 152 spindles = 1,064 sp. Remarks: 2 cards grinding.	...	8	8,512
	SPINNING AND WEAVING MACHINERY			
22	Ring frames, ways 3¼" ga. 2" s. 228 sp.	8,000	1.63	8,200
4	Spoolers 5½" ga. 6" traverse	....	2.16	8,640
1	Quiller 20 sp. each	....	....	....
4	Warpers 480 spools each 6x4" spools	....	2.16	8,640
5	Twisters 4½" ga. 3½" ring 168 sp. 840 spindles	4,176	5.	4,200
2	Twisters 7" ga. 5½" ring 120 sp. 240 spindles	2,400	18	4,320
2	Twisters 5½" ga. 4½" ring 120 sp. 240 spindles	2,400	22	4,400
1	Respooler, 40 spindles 6½" ga.	....	....	....
1	72½" cord loom	120	4,000	4,000
10	72½" automatic tire fabric looms	115	400	4,000
1	Warp compressor, complete	....	....	....
1	Inspecting machine	....	....	....
1	Curtis & Marble calender	....	....	....

Great care should be taken in the selection of the machinery. This is not a matter to be attempted by inexperienced persons, but is a task in which the services of an expert are of the utmost value.

MILL SUPPLIES. For the successful operation of each department of the mill, tools and other supplies are necessary. These generally consist of cotton bale scales, picker lap scales, roving cans, bobbins, spools, skewers, harnesses, heddles, reeds, shuttles, picker sticks, leather pickers, harness and lug straps, and the various miscellaneous supplies such as belting, oil, trucks, etc., as used in most every manufacturing plant.

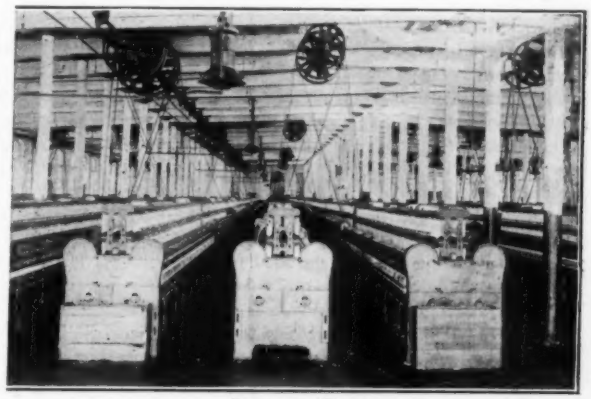
ROUTING THE COTTON

BALE BREAKING. When the cotton comes to the mill it is in the familiar bales of commerce, 500 pounds to the bale. After being opened the cotton is fed to a machine known as the bale-breaker. Here the matted cotton is loosened and torn into small bunches, which are delivered to the "feeder."

AUTO FEEDING AND BREAKER PICKING. The feeder is an automatic machine containing a series of pin-studded flats which deliver the bunches of cotton in regular quantity over a conveyor apron into the next machine, known as the breaker picker. This machine gives the cotton a severe beating by means of two revolving shafts on which there are mounted two and three rows of arms. These shafts revolve from 850 to 1,000 times a minute, so that the cotton gets a certain number of blows per inch. The result is that the sand and other foreign matter in the cotton loosen and leave the staple in tiny tufts. These are caught up by air suction and delivered to the next part of the machine, where they receive another beating, to remove persistent dirt, and are then rolled together in a great downy sheet on a rod. This sheet is known as lap.

FINISHER PICKING. Four of these laps are fed into the next machine, known as the finisher picker. It beats the cotton some more, and the four laps come out a further purified single lap, which looks like cotton batting.

CARDING. After all these beatings, one might think that no dirt would remain, but there are still some particles of leaf, seed pods, etc., clinging fast. So another machine, known as the card, is designed to the task of removing the remaining impurities, and of loosening and separating the fibers, so that they can be drawn parallel with each other. The card has two big drums, each covered with a wire-studded cloth and revolving so as barely to miss touching one another. There are some 72,000 of the projecting wires to every square foot and no fiber has a chance to escape its combing. The fiber leaves the big drums in a thin sheet (web) about 40 inches wide, and is then passed through a set



SPINNING ROOM

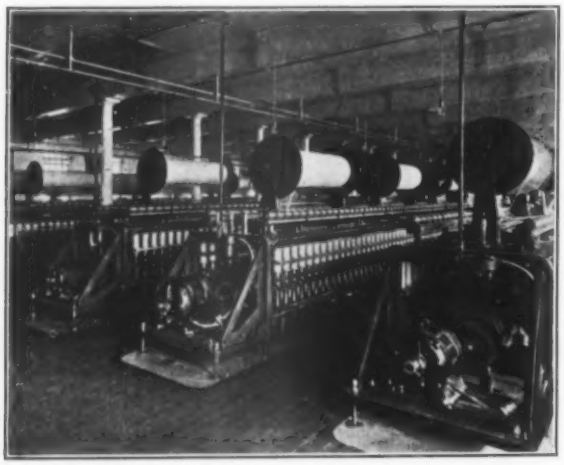
of reducing rolls which convert it into a rope about an inch in diameter, known as a "sliver." This is coiled in a large fiber or roving can 36 inches high and 12 inches in diameter.

TWO-PROCESS DRAWING. The next step is to put the sliver through the drawing frames. Six slivers as they come from the card are combined into one in the first frame, which consists of a series of rolls, the last pair of which revolve six times as

fast as the first pair, thus making the slivers that come out of the frame six times as long but of the same diameter as the ones that went in. Six of these latter slivers are fed into the second drawing frame and transformed into one. All that has been lost in diameter heretofore has by now been gained in length. But at this time the sliver is only a mass of parallel fibers and has no strength whatever. The succeeding two operations are intended to give it a certain amount of twist, so that the fibers will cling together, while the size is reduced.

SLUBBER. In the first of these operations final slivers from the drawing machine are fed into a machine known as a slubber. It takes these and simultaneously twists and stretches them into one strand, much longer, but with a diameter reduced to that of a clothes line; this it winds on a headless-spool bobbin, known as the slubber bobbin, the resulting material being called roving.

INTERMEDIATE AND FINE FRAMES. Two strands of this roving from the slubber are next twisted and stretched into one,



Westinghouse Electric & Mfg. Co.

TWISTERS INDIVIDUALLY DRIVEN BY MOTORS

which is wound on bobbins of the intermediate frames. Two of these intermediate rovings in their turn are twisted and stretched into a final roving, which has about the diameter of a wrapping string.

RING SPINNING. Two of the bobbins containing the final roving are now set up on the creels in the spinning frame. These strands of roving go through a trumpet and then through a set of rolls running at different speeds, which still further stretch it until it becomes the size of yarn wanted. Next it passes through a small steel ring, called the traveler, which runs at a very high speed on a ring, in the center of which is the fast-revolving spindle. From the traveler the yarn is wound on the bobbin on the spindle and gets the required twist.

SPOOLING. The bobbins of single yarn are then taken from the spinning frame and put on the spooler. Here the yarn is wound on large spools that hold about a mile of thread.

WARPING. After the single yarn is wound on the spools, several hundred of the latter—according to the number of ply to be twisted—are set in a frame known as the warper creel. These threads are all wound, side by side, on a big reel, known as a warper beam.

TWISTING. This warper beam, by means of a traveling crane, is placed above the twister frame. The object of the twister is to form the ply yarn by inserting a sufficient amount of twist in the required direction and to wind the resulting yarn on a twister spool, which must be of large size to reduce the amount of knots, which are not permissible in tire fabrics.

The principle on which the ring twister is constructed and operated is to pass the yarn from a creel to delivery rolls and twist it by passing it through a traveler that is revolved rapidly around a ring, by means of a rotating spindle carrying the spool. The difference between the circumferential speed of the spool and the speed of the traveler causes the twisted yarn to be wound on the bobbin. The twister closely resembles the ring spinning frame, a large number of parts and motions of which are duplicated.

The ring sizes vary according to the number of ply yarn desired. For 23/5/ ply a 3½-inch ring is standard and for cabling 23/5/3 ply a 5½-inch ring is standard. For 23/11 ply the 4½-inch ring is almost universally used.

THE WARP COMPRESSOR FOR DIRECT BEAMING. To make a piece of builder tire fabric 60 inches wide requires 1,380 warp threads. So, 1,380 spools of twisted yarn are placed in a creel (similar to the warper creel). The yarn is unwound and passed through the compressor rolls and then wound around the loom beam, where it is ready for drawing in, which is the process of threading the harnesses. For tire fabric, two harnesses are required, which consist of wires or twine cords, each with an eye in the middle. Each alternate thread goes through an eye of one harness, and the others through the corresponding eye of the other harness.

WEAVING AND FINISHING. The harnesses and warp beam are now placed in the loom and the threads drawn around the take-up roll in front of the loom, and the cloth is now ready to be woven.

There are other auxiliary machines, as the quiller, which winds the filling yarn onto the quill. This is put into the shuttle, which is thrown from side to side, the operation being known as picking.

From the loom, the fabric is taken to the inspection table, then to the burler, where all loose ends are cut off, all bunches and knots removed, ends sewed in and oil spots removed. Next, the fabric is taken to the brushers, where it is thoroughly brushed, and finally it is steamed and calendered, wrapped in paper and burlap, and shipped.

THE INTERNATIONAL B. F. GOODRICH CORPORATION

THE announcement of the organization of The International B. F. Goodrich Corporation marks another widening of the field of activities of the big rubber manufacturing concern which recently rounded out its fiftieth year.

The B. F. Goodrich Co. made its first entry into foreign markets more than twenty years ago, during the latter part of which time the growth has been rapid. Its products have been introduced into every civilized country on the globe and indeed have been and are being used in out of the way lands which are just beginning to feel the first influences of civilization.

The new company, which has just been incorporated under the laws of New York with a capital of $10,000,000, will represent The B. F. Goodrich Co. in foreign countries. It will take over the parent company's interest in factories (with selling organizations) located in France and Japan, as well as its selling subsidiaries in Great Britain, Italy, Spain, South Africa, Straits Settlements and Porto Rico, acquiring distributers in all foreign countries. It will handle all the products of the parent company—tires for automobiles, trucks, motorcycles and bicycles; rubber footwear; conveyor and drive belts; hose and packing; water bottles and surgical rubber goods; in short, all of the thousands of different products now being made by The B. F. Goodrich Co at the Akron, Ohio, factories will come within the scope of the new company which will, in addition, produce and sell products in France and Japan.

The aggressive and progressive sales methods of the parent company and its subsidiaries have established a great volume of foreign business and its steady and rapid increase has made necessary an organization like The International B. F. Goodrich

Corporation, through which will be effected centralization of all these foreign activities. With the new company as selling representative of the parent company, as well as producing in France and Japan, the entire foreign operations of the Goodrich interests will be directed from Akron.

The directors of the new company are: B. G. Work, W. O. Rutherford, H. K. Raymond, L. D. Brown, H. Hough, W. C. Arthur, C. B. Raymond, F. C. Van Cleef and W. C. Geer, of whom the first six named constitute the Executive Committee.

The officers are: B. G. Work, president; W. C. Arthur, vice-president; F. C. VanCleef, secretary; L. D. Brown, treasurer; H. Hough, comptroller; F. E. Titus, director of sales, and W. H. Allen, director of manufactures. The actual operation of the affairs of the new company will be directed by W. C. Arthur, vice-president, formerly assistant secretary of The B. F. Goodrich Co., with whom will be directly associated F. E. Titus, formerly foreign sales manager of The B. F. Goodrich Rubber Co., who will have general direction of sales, and W. H. Allen, formerly assistant superintendent and technical director of The B. F. Goodrich Co., who will have general direction of manufacturing activities of the subsidiaries of the new company.

The New York offices of the new company will be located at 1780 Broadway. The administrative and operating offices will be located at Akron, Ohio.

THE INTERNATIONAL ACCEPTANCE BANK

FINANCIAL doctors have prescribed many remedies and industrial experts have outlined many plans for the rehabilitation of "Sick Europe." Some are of proved value, some are novel and may merit at least a fair trial, and many are manifestly impractical or impossible. One of the most reasonable projects which may be justly placed in the first class, is that which the International Acceptance Bank, recently organized in New York, plans to put into effect to facilitate the handling of foreign trade in this country. The new institution is officered by a group that includes many of the ablest bankers, industrial leaders, and experts on business conditions in not only the United States but the world. Conspicuous among them is Charles B. Seger, president of the United States Rubber Company, and who is a member of the board of directors of the new bank. Paul M. Warburg, former vice-governor of the Federal Reserve Board, and an internationally-recognized authority on business and credits, is chairman of the board. Other directors are Daniel G. Wing, president of The First National Bank of Boston, who is vice-chairman of the new bank's board; F. Abbott Goodhue, president; Newcomb Carlton, president of the Western Union Telegraph Co.; and Felix M. Warburg, of the international banking firm of Kuhn, Loeb & Co.

CHARLES B. SEGER, A DIRECTOR OF THE INTERNATIONAL ACCEPTANCE BANK

The primary purpose of the International Acceptance Bank is stated to be the development of sound, scientific methods of handling general trade between this and foreign countries. Inasmuch as credit has played and probably always will play a very considerable part in international commerce, all merchants and financiers realize that one of the prime essentials for the early reestablishment of satisfactory mercantile relations with the war-spent nations of Europe is an ample line of credit with all reasonable safeguards for the seller of merchandise on this side of the Atlantic. It is the aim of the new bank to provide such accommodation for responsible foreign buyers and to supply merchants and manufacturers on this side of the sea with proper protection for the accounts of the overseas purchasers. Imports and exports will be financed, bankers' acceptances handled, foreign money dealt in, and foreign exchange transacted on the broadest possible scale.

"There is nothing odd or strange about our plan," said a representative of the new bank. "We shall simply draw on the European banks that are affiliated with us, and they in turn will draw on us. They will accept our drafts and we shall accept theirs, and we both shall sell such vouched-for drafts in the open market. We shall try in every fair way to facilitate trade between this and other countries, and we are confident that we can do this in a very considerable degree. But while we shall be alert and enterprising, we shall in no way depart from any of the principles of sound and conservative banking."

The new bank will not maintain agencies of its own in various foreign trade centers, thus avoiding a large overhead, but will have all its dealings with representative banks abroad that have become stockholders. Stock-owning banks are located in Canada, Belgium, Holland, Great Britain, Sweden and Switzerland, as well as in Birmingham, Boston, Chicago, Cleveland, Detroit, Kansas City, Los Angeles, Minneapolis, New York, Philadelphia, Portland (Oregon), Providence, San Francisco, Seattle, St. Louis, and Youngstown, Ohio. This number may before long be largely increased and the service and helpfulness of the International Acceptance Bank correspondingly enhanced.

RUBBER TRADE INQUIRIES

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(876) A reader asks for the address of the manufacturer of "Rexhyde" glue.

(877) Inquiry is made for the addresses of importers of transparent nipples.

(878) Request is made for the address of the British manufacturer of "Ablutonic" rubber sponges.

(879) A correspondent desires the addresses of manufacturers of clincher and straight-side beads for fabric and cord tires.

(880) A manufacturer requests addresses of concerns making removable rubber heel pads for wear inside shoes.

(881) The addresses are desired of the manufacturers or dealers in the following named vulcanization accelerators: "Adco," "Annex," "S-4-S," and "T. N. X."

(882) A wholesaler and manufacturers' agent requests the address of a concern handling the French toy known as "Le Roquet," a metal dog's head made to bark by pressure on an attached rubber bulb.

(883) Inquiry is made for a chemical to put in rubber cement to make balloons heavier with fewer dippings.

(884) A request had been received for the addresses of manufacturers of pure rubber cement, preferably pale-blue.

(885) A reader asks for the addresses of manufacturers of calendered cloth used in the manufacture of dress-shields.

(886) A correspondent inquiries where bathing-cap or toy-balloon rubber can be obtained by the yard.

(887) Inquiry is made for the addresses of manufacturers of sponge rubber.

(888) A reader desires the address of the manufacturer of a machine for trimming off the overflow on molded nipples.

(889) A correspondent requests the address of the manufacturer of Day's rubber protector for trousers.

(890) A manufacturer desires the address of manufacturers of doubling calenders used for uniting rubber sheets.

(891) A manufacturer of rubber nipples asks how to make them bloom.

(892) Information is requested concerning the source of supply of "Wasatch," said to be a compounding ingredient.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet and state number.

District Offices.	Cooperative Offices.
New York: 734 Customhouse.	Cleveland: Chamber of Commerce.
Boston: 1801 Customhouse.	Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Chicago: 504 Federal Building.	Dayton, Ohio: Dayton Chamber of Commerce.
St. Louis: 402 Third National Bank Building.	Los Angeles: Chamber of Commerce.
New Orleans: 1020 Hibernia Bank Building.	Philadelphia: Chamber of Commerce.
San Francisco: 307 Customhouse.	Portland, Oregon: Chamber of Commerce.
Seattle: 848 Henry Building.	

(34,941) A merchant in Sweden desires to communicate with firms dealing in automobiles, motorcycles, and accessories. Catalogs requested.

(34,947) A commercial agent in Ireland desires agency or commission for the sale of druggists' sundries.

(35,037) A mercantile firm in Denmark desires to secure an agency for the sale in the Scandinavian countries of both pneumatic and solid tires for automobiles and trucks.

(35,046) A commercial agent in Spain desires to secure the representation of firms for the sale of rubbers.

CURBING TIRE "SECONDS" SALES

Tire dealers in California who sell only "firsts" may soon invoke the aid of the courts in enforcing a new state law (Senate No. 917) to curb the activities of unscrupulous second-hand tire men who are said to palm off a great many repainted tires as new. While the law is designed to cover all kinds of dealings in second-hand, defective, or imperfect merchandise, and requires all such goods to be properly branded, tire dealers claim that in spirit and letter it especially protects "straight-shooters" in their line from fraudulent operators who have cut considerably into legitimate business in all the large cities on the Coast. The measure was actively supported by the advertising clubs of the state, which claim that California is the first of the forty-eight states to enact such legislation for the safeguarding of buyers.

BANKRUPTCY SALE OF THE FORT WAYNE TIRE & RUBBER MANUFACTURING CO.

The Fort Wayne Tire & Rubber Manufacturing Co., Fort Wayne, Indiana, that went into voluntary bankruptcy last April, will be sold at private sale on July 5 to the best bidder. The factory occupies 2½ acres adjoining the New York Central railroad and the Fort Wayne and Northwestern Interurban Line. The plant comprises a three-story pressed brick building and three one-story out-buildings, equipped with machinery for the production of 300 to 500 tires and tubes a day. The property is appraised at present values as follows: land $16,400; buildings, $137,500; machinery, equipment and inventory, $110,000.

FINAL DECLARATION OF THE EIGHTH NATIONAL FOREIGN TRADE CONVENTION

THE National Foreign Trade Council is directed by the best business minds of the country in the advancement of American trade in foreign markets. The rubber industry is ably represented on the council by E. H. Huxley, president of the United States Export Co., New York, N. Y.

E. H. HUXLEY, MEMBER OF THE NATIONAL FOREIGN TRADE COUNCIL

At the meeting held in Cleveland, Ohio, May 4-7, 1921, a national program for American trade during the coming year was adopted, the special features of which are as follows:

1. Increased imports into the United States.

2. The drawing upon surplus American investment funds in order to furnish long-term credits to foreign buyers.

3. Immediate creation of financial institutions under the Edge Law to extend such long-term credits.

4. Pending the revival of world commerce, the laying up of such of our government-owned merchant marine as cannot be chartered on a bare-boat basis or on time charter to private operators.

5. Revision of our shipping laws, which subject American vessels to a competitive disadvantage estimated at 5 per cent on the capital investment.

6. Uniformity of state laws affecting marine insurance companies.

7. Adequate international machinery for the enforcement of awards of commercial arbitration; and application of standardization to products not already so protected.

8. Adoption of revised and uniform commercial letters of credit and ocean bills of lading.

9. Maintenance of interest in American foreign trade, even though it shows no profit for the moment; and remembrance that in many cases it will cost much more to regain in the future a business lost now through lack of courage and foresight.

10. A bargaining tariff.

11. A reorganization of the foreign service of our government, which will provide for unified control, and a permanent career to be started at a National Foreign Service Training Academy.

12. The passage of the China Trade Act, which will permit the formation of American companies to trade in China on a plane of tax equality with competitors of other nationalities.

13. The change in our taxation laws which will free Americans living abroad from paying taxes upon income derived from within the foreign country of residence.

14. Adequate support for those departments of the government which participate in the development of our foreign trade.

15. The revision of our revenue laws necessary to permit the negotiation of a parcel post convention with Cuba.

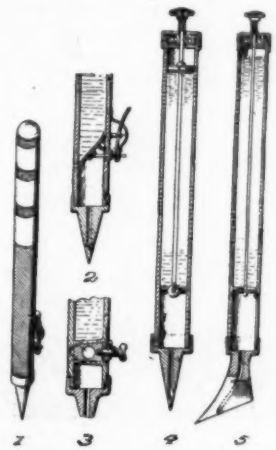
16. The wider use of foreign trade news by our press.

17. The expansion of systems of international telegraphic communication under American control and operation.

New Goods and Specialties

UP-TO-DATE MANICURING

THE manicure maid, with her trim array of little jars and bottles, may now be up-to-date with the latest instrument for her assistance. It consists of a hard rubber tube, something like that used for fountain pens, provided with a hollow interior for liquids, a plunger for operating, and a valve for regulating the amount of liquid let out through the opening at the point. In different modifications the views shown illustrate: (1) perspective of complete manicuring instrument with cone-shaped point; (2) sectional view through lower portion, showing valve; (3) modified form of valve; (4) sectional view showing valve open; (5) modified form of instrument with curved point.



HARD RUBBER MANICURING INSTRUMENT

The ordinary method of procedure is to wrap a small piece of cotton around the tip of an orange-wood stick, dip it in the particular medicament, and apply it to the cuticle at the base of the finger-nail. To keep this cotton moist it must be dipped frequently into the liquid or ointment and the amount taken up cannot be accurately regulated.

This device is intended to substitute the orange-wood stick and facilitate the application of medicaments by providing means for both controlling the flow and supplying them in regulated quantities as needed.—United States patent No. 1,365,883, Martha V. Bauer, 2443 18th street, N. W., Washington, D. C.

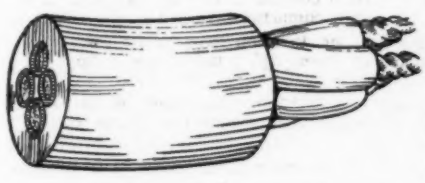
RUBBER-LINED MONEY-BELT

The utility of safety belts with rubber-lined pockets was so well proved during the war that they are still popular. Another style is illustrated here which has three divisions of equal width, covered by snap-fastened flaps. One of these divisions, in turn, is redivided into three smaller pockets, and another part into one small one and one of medium size. The belt fastens with the customary strap and buckle.—King Razor Manufacturing Co., Indiana, Pennsylvania.

SAFETY BELT WITH POCKETS OF DIFFERENT SIZES

BRITISH SOLID RUBBER CABLE

What the manufacturer designates a solid rubber trailing cable is shown here. The conductors are insulated in the usual manner with the required grade of rubber to meet standard electrical tests. The covering of solid rubber is then put on as a protection. This type of cable is used largely on wharves, docks, and in mines for traveling cranes and portable electrical machinery and apparatus where it is subjected to considerable rough usage and sometimes has to stand the strain of being walked on.—W. T. Henley's Telegraph Works Company, Limited, Blomfield street, London Wall, London, E. C. 2.


SOLID RUBBER TRAILING CABLE

COMBINATION WINDOW WASHER AND DUSTER

Housekeepers who have been worrying about the new law which requires windows to be cleaned by window-cleaning men instead of the house worker will be delighted with the new window washer and duster which eliminates sitting outside the window. The washer is equipped with a rubber squeegee which cleans and dries the window in a most satisfactory manner, working on the outside while the operator stands inside the room. Attaching a cloth to the end makes a long-handled duster for ceilings, walls, floors and corners. The adjustable joint in the pole makes it adaptable to circumstances.—Perfect Window Washer & Duster Co., Inc., Amsterdam, New York.

THE PERFECT WINDOW WASHER AND DUSTER

ELECTRICAL BEAUTY DEVICE

An appliance intended to improve the complexion, fill up wrinkles or hollows, and stimulate the scalp is "La Vida" vibrator. This device gives 7,200 vibrations a minute and does not slacken speed under pressure, the manufacturer claims. It is built for the natural alternating current, 100 to 125 volts, for 25, 30 and 60 cycles. It can be used for bodily massage as well as for the complexion and scalp. The appliance is fitted with a rubber suction cup and contains no motor to get out of order. It attaches by the usual cord to any light-socket.—The Adbro Manufacturing Co., Pittsburgh, Pennsylvania.

"LA VIDA" VIBRATOR

CROSS-STRAP SANDAL FOR SUMMER

Fleet feet running up and down the beach or over velvety lawns, in summer, will look both comfortable and sensible wearing the cross-strap rubber-soled sandal known as the "Fenway." Mothers will find them practical and long-wearing if they let their children give them a trial.

"FENWAY" CROSS-STRAP SANDAL

This sandal is made with an upper and straps of brown duck and the straps and top are bound with white. The white flange sole is extra thick and there is a spring heel to meet the demand for comfortable, sensible footwear for beach and country wear. These sandals are made for both misses and children

and are new this year, but already their popularity is noticeable.—Hood Rubber Products Co., Inc., Watertown, Massachusetts.

RUBBER LAUNCHING DEVICE FOR TOY AIRPLANES

A novelty that will please the boy interested in aeronautics is a launching device for his airplane, that will make it fly farther and protect it from damage by careless handling.

AIR GLIDERS

It consists of a band of rubber attached to two sticks. These sticks are placed upright in the ground, the length of the band apart. After the motor of the airplane is wound, the end of the plane is hooked over the band of the launcher, and pulled backwards towards the youngster, as far as it will go. When released, the contraction of the rubber shoots the plane forward in an upward position. Not only does it enable the boy to fly his plane farther, but it greatly aids the inexperienced to properly launch such a toy without injury.

The launchers are made in two sizes. The smaller consists of only one stick with a looped band attached. Very thrilling loop-the-loops can be made with this size. The double motor type has twin propellers of bent wood, enameled a bright red. The planes are of balsa wood, well-varnished, and the frame is of blue lacquered wood. The motor threads are of Pará rubber. The average small boy with one of these toys considers it the king of kings, for the plane twenty-eight inches long is claimed to fly 1,800 feet.—Broadfield Toy Co., Hempstead, New York.

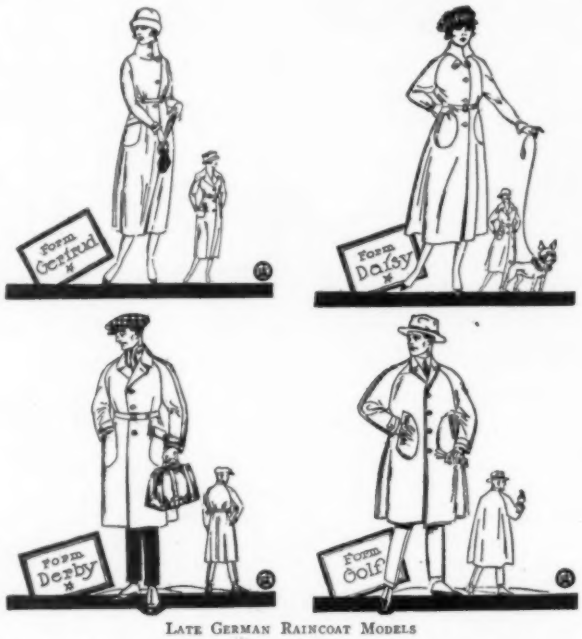
IDEAL FASTENING FOR TOBACCO POUCHES

The "Locktite" tobacco pouch is made in suede, calf, buckskin, pigskin, silk and assorted grain leather to meet the tastes of the most fastidious mortal. The pouch is lined with rubber which keeps the contents moist. The metal top locks and unlocks by the simple expedient of pulling the tip across the top. This patented fastening is similar to that used on the "Jiffy-Lock" bathing bag described in THE INDIA RUBBER WORLD, August 1, 1919. The opening can be adjusted so that a small amount of tobacco will drop into the cigarette paper, or can be opened to full extent to permit the insertion of the pipe to be filled. When closed, no tobacco can sift out. The pouch is made in sizes to fit the pocket.—The F. S. Mills Co., Inc., Gloversville, New York.

"LOCKTITE" TOBACCO POUCH

STYLES IN GERMAN RAINCOATS

It was about 50 years ago that Germans first tried to make raincoats themselves. The rubberized fabrics for the purpose had to be imported from England and the garments produced were far from satisfactory, particularly because it was the aim of manufacturers to quote prices as low as possible, with little regard for quality. However, by degrees the quality was improved and before the war the industry had made great headway; there was a lively demand for the German article both at home and abroad. During the war, lack of material caused a set-back; at present difficulty is still experienced in obtaining the necessary raw materials, but in spite of this a satisfactory variety of stuffs and models is shown by local manufacturers. It is claimed that in workmanship and style the German article can successfully compete with the product of any foreign country. The models below (Imperator Regenmäntel) give an idea of what the Germans are making in the way of raincoats. All the models shown by different manufacturers are made to be worn open or buttoned closely about the throat. They come in rubberized and impregnated



LATE GERMAN RAINCOAT MODELS

fabrics and are also used for sports and as spring or fall coats. One line of raincoats, known as "Waterline-Mäntel," is made of cloth impregnated by a special process, and it is claimed that they equal the well-known Burberry coats.—Firma Hartman & Klempner, Rosenstrasse 16, Berlin C., Germany.

METALLIC REINFORCED FABRIC PNEUMATIC TIRE

The carcass of this tire is composed of two layers of cords over which the radial chains embedded in the rubber are laid, completely covering the carcass. The breaker strip is built up of two layers of cord fabric embedded in rubber and interposed between the tread and the chain. It is claimed that the riveted chain armor does not reduce the resiliency below that of the ordinary fabric tire. The feature of this tire is that it is absolutely unpuncturable. The tire can be retreaded and if any of the chains have been damaged they can be replaced at the time of retreading, as each length from one bead to the other is independent. It is claimed that the Gautier tire is able to resist an internal pressure up to 4,000 pounds per square inch, to carry a much bigger load, and to outlast any fabric type.—C. M. Gautier, 14 Unwin Mansions, Queen's Club Gardens, West Kensington, W. 14, England.

GAUTIER ARMORED TIRE

BABY ON PNEUMATIC TIRES AND MAID UNTIRED

Even the baby must ride on pneumatics these days. The baby carriage equipped with pneumatic-tired, ball-bearing wheels was sure to come, and the tire used by the pioneer manufacturer in this direction is illustrated here. It has a practical non-skid tread and in appearance resembles a bicycle tire but, of course, is smaller. The designer of these carriages considered the baby's comfort in providing the pneumatic tire, but also thought of the one who must push the carriage and added the ball-bearings which make it glide along easily with only slight pressure.—The American-National Co., Toledo, Ohio.

BABY CAB PNEUMATIC TIRE

CORD TIRES FROM COAST TO COAST

The development of the cord tire during the last few years and its demonstrated popularity has resulted in the establishment of factory facilities for making high-grade cord tires in all parts of the country. A few of the newer ones are shown here.

The Knox cord tire is the product of a new factory opened last year to manufacture both cord and fabric tires and red and gray tubes of the best quality.—The Knox Tire & Rubber Co., 10 East Chestnut street, Columbus, Ohio.

The "Savage" cord tire comes from the Pacific Coast. It is oversize, hand-built from 17¼-ounce Sea Island fabric and the best quality plantation and Pará rubber. There is a cushion skim between the plies of fabric and a specially-woven breaker strip and breaker cover, giving practically a double cushion.—The Spreckels "Savage" Tire Co., San Diego, California.

The "Autocrat" cord tire is particularly massive, has a mileage strip that insures long life, and a double grip to prevent skidding.—McClaren Rubber Co., Charlotte, North Carolina.

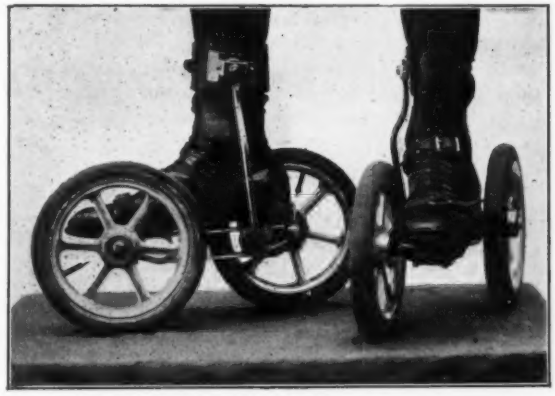
The Amazon cord features a new tread design with wider non-skid lugs. This tire is made in all popular sizes including the 30 by 3½ clincher for Ford and other light cars.—The Amazon Rubber Co., Akron, Ohio.

The Star cord also presents a new tread in black and is fully ten per cent oversize, with extra heavy clincher. It is 30 by 3½ but inflates to 31 by 3.85 inches.—The Star Rubber Co., Akron, Ohio.

The "Holyoke" cord comes from New England and is made in one of the newer factories there, from the company's own formulas, in its own molds.—New England Tire & Rubber Co., Inc., Holyoke, Massachusetts.

THE CLARK PEDMOBILE

As seen by the illustration, the pedmobile is a specialized vehicle for road use. It is neither a small bicycle nor a large pair of skates, yet either term is partially applicable to its description.



PNEUMATIC-TIRED SKATES

It is light and portable like a pair of roller skates, weighing from four to six pounds, yet it glides over the roadway as smoothly as a bicycle.

The pedmobile is mounted on Palmer cord tires, either single or inner tube, with detachable casings which are used at 100 to 125 pounds inflation pressure. Even at this pressure there is enough flexibility to permit easy steering which could not be done were solid tires used.

Another important feature of the pedmobile is the band brake device that is effectively operated by a forward pressure of the leg below the knee.—Clark Pedmobile Corporation, 60 Grand street, New York, N. Y.

KNOX "SAVAGE" "AUTOCRAT" AMAZON STAR "HOLYOKE"

Activities of The Rubber Association of America

AUTHENTIC RUBBER INFORMATION, HOOVER'S PLAN

THE Board of Directors, in conjunction with the regular monthly meeting held at Washington June 2, conferred with Secretary of Commerce Hoover, relative to his plan for coöperating with trade organizations representing the basic industries of the United States, in gathering authentic information concerning their inventories, production, sales, production capacity, etc.

The plan may be described briefly as follows:

1. Increased efficiency with respect to the commercial activities of the Department of Commerce in foreign markets, this work to be aided by the employment of specialists in the Department who will have a thorough knowledge of the needs of the key industries.

2. Collection and compilation of data indicating current conditions in the basic industries relating to raw material stocks, production, inventory and sales of finished goods, etc.

3. Assist business in simplification of products for the purpose of bringing about maximum economy in production and distribution.

The directors indicated to Secretary Hoover their willingness to coöperate in this plan, and later conferences will be held between the Department and the various divisions and committees of The Rubber Association.

MEETINGS

The Executive Committee of the Tire Manufacturers' Division held an important meeting at Hotel Traymore, Atlantic City, New Jersey, on June 15. Optimism regarding the future of the tire industry was the key-note of the meeting.

The Executive Committee of the Foreign Trade Division met at the Yale Club, New York, on June 17.

The Cycle Tire Manufacturers' Committee held a meeting in the Association offices on June 22.

The Board of Directors met at the Union League Club, New York, on June 24.

DIVISIONS AND COMMITTEES

The following is a list of the committees and divisions which compose The Rubber Association and conduct its general activities. Any member who is not affiliated with the division in which he belongs should communicate with the Secretary.

Tire Manufacturers' Division:
  Technical Committee,
  Cycle Tire Manufacturers' Committee.
Traffic Committee.
Mechanical Rubber Goods Manufacturers' Division.
Mechanical Goods Specification Committee.
Rubber Sundries Manufacturers' Division.
Rubber Reclaimers' Division.
Rubber and Fiber Sole Manufacturers' Division.
Rubber Clothing Manufacturers' Division.
Rubber Proofers' Division.
Foreign Trade Division.
Hard Rubber Manufacturers' Division.
Footwear Division.
Industrial Relations Executive Committee.
Tax Committee.
Crude Rubber Committee.
Publicity Committee.
Cost Accounting Committee.

PROPOSED LEGISLATION RESTRICTS ILLINOIS TIRE INDUSTRY

Senate Bill No. 352 introduced by Senator Kessinger in the Illinois General Assembly April 13, provides that: It is unlawful to sell or offer for sale within the State of Illinois, a motor vehicle tire unless it is marked with letters and figures at least one-eighth of an inch in height showing the month and year of manufacture. The Act does not, however, prohibit the sale or offering for sale of any tire held within the state by any person at the time the Act goes into force. The fine for violation of the proposed Act is not less than $5 or more than $50.

REPORTS OF THE TRAFFIC COMMITTEE

The following changes in ratings on liquid rubber cement will be made effective on or about July 20, 1921. The old and new ratings follow:

	Classes					
	Official		Southern		Western	
Rubber Cement:	Old	New	Old	New	Old	New
In glass or earthenware packed in barrels or boxes	1	1	1	1	1	1
In metal cans or tubes in barrels or boxes	2	2	2	2	1	*2
In bulk in barrels, L. C. L.	3	3	4	*2	1	*2
In bulk in barrels, carloads, min. weight, 30,000 lbs.	3	*3	4	4	1	*4

*Change from present rating.

CHANGE OF RATINGS IN SOUTHERN TERRITORY

Following the ruling of the Official Classification Committee, the Southern Classification Committee, representing carriers south of the Ohio and Potomac Rivers, and east of the Mississippi will accept shipments of rubber shoddy (reclaimed rubber) in rolls and slabs to and between points in the South, in less than carload lots.

The present rating on rubber composition tiling to and between points in Southern Classification territory is in carloads, second class, with minimum carload weight of 30,000 pounds. The Southern Classification Committee has arranged for a reduction in the carload rates to fourth class with the same minimum carload weight.

FEDERAL HIGHWAY LEGISLATION

Members are urged to give careful consideration to the highway legislation proposed in the House and Senate of the United States.

The Townsend Bill, S-1355 now before the Senate, not only proposes financial aid to the states in constructing units in the national highway system but it also insures national interest in the work through a Federal Commission that will execute the provisions of the law.

The Dowell Bill, H. R. 5693 now before the House, proposes provisions similar to those of the Townsend Bill except that the commission form of administration is not advocated and the application of Federal aid to state roads is permitted without regard to the necessity for such roads or their relation to a comprehensive interstate system.

It is believed that the Townsend Bill will be considered favorably in the Senate, but there is a possibility that the Dowell Bill may be successful, which would result in a compromise measure and probably the defeat of the commission form of administration and control.

TWENTIETH ANNUAL SUMMER OUTING

The twentieth annual summer outing of The Rubber Association of America will be held at the Seaview Golf Club, Absecon, New Jersey, Thursday, July 21, 1921. A special train will be operated by the Pennsylvania railroad between Absecon and New York to convey the members of the Association and their guests to and from those points. Golf tournaments, tennis matches, trap shooting, baseball, swimming, etc., will, as usual, be provided. Detail announcements concerning the outing and the various contests will be distributed to all members.

J. V. MOWE, Chairman,
W. J. KELLY,
Outing Committee.

News of the American Rubber Industry

NEW INCORPORATIONS

ALFRED Covered Wire Co., June 20 (New York), $15,000. A. Gleckel, 149 Stagg street; F. Romph, 277 Menahan street; J. H. Johansen, 147 Scholes street—all of Brooklyn, New York. Principal office, Brooklyn, New York. To manufacture insulated wire, etc.

Allied Rubber Cos., Inc., The, February 14 (Maryland), 500,000 shares of stock without par value. W. Leary, 2539 Kenilworth Road; J. A. Curtis, Schofield Building—both of Cleveland, Ohio; L. E. Mihm, Calvert Building, Baltimore, Maryland. Principal office, 450 Leader-News Building, Cleveland, Ohio. To manufacture, buy, sell and generally deal in rubber and gutta percha.

Alto Rubber Co., Inc., June 3 (New York), $6,000, 600 shares no par value. R. Schlissel, 465 East 167th street; H. Hewitt, 333 West 21st street, both of New York City; S. Moore, 179 Jefferson avenue, Brooklyn—both in New York. To manufacture rubber glue, chemicals, varnish, etc.

Atlantic Stamp & Stencil Works, Inc., June 21 (New York), $5,000. M. & B. Moss, both of 584 Decatur street. L. Moss, 97 Hale avenue—both in Brooklyn, New York. To manufacture rubber stamps, etc.

Augorcon Co., The, April 28 (New Jersey), $1,000,000. D. L. Gordon, 27 High street; T. A. Hopkins, 230 High street—both of Passaic, New Jersey; J. F. Connolly, 731 Atwell avenue, Providence, Rhode Island. Principal office, 625 Main avenue, Passaic, New Jersey. Agent in charge, D. Gordon. To manufacture rubber and other materials.

Azif & Honig Tire Co., Inc., June 18 (New York), $30,000. M. and E. K. Azif; S. G. Honig—all of 974 St. Nicholas avenue, New York, N. Y. To manufacture tires, etc.

Bedford Auto Rim Co., Inc., May 23 (New York), $100,000; C. Z. and F. Weiner, both of 520 Lafayette avenue, Brooklyn; I. S. Natkin, 8902 107th street, Richmond Hill—both in New York. Principal office, Brooklyn, New York. To manufacture tires and rims.

Berry-Gorman Tire & Rubber Co., March 24 (Oklahoma), $150,000. H. Gorman; W. C. Berry; H. H. Hensley—all of Tulsa, Oklahoma. Principal office, 209 East Second street, Tulsa, Oklahoma. To buy, sell and deal in tires and automobile accessories, etc.

Champion Manufacturing Co., March 25 (North Carolina), $50,000. K. B. Nixon, president; B. C. Lineberger, vice-president; M. M. Rudisill, secretary and treasurer. Principal office, Lincolnton, North Carolina. To manufacture and distribute automobile tire patches.

Climax Rubber Co. of New Jersey, May 24 (New Jersey), $1,000,000. W. J. Gilberds, 1 Hall Block; W. S. Rexford, 5 Hall Block—both of Jamestown, New York; J. P. Tarr, 1207 Firemen's Building, Newark, New Jersey. Principal office, 1207 Firemen's Building, Newark, New Jersey. Agent in charge, J. P. Tarr. To manufacture, purchase and sell rubber goods.

Coast Rubber Importers, Inc., March 7 (California), $50,000. H. Rassmussen, Alameda; G. Kells, San Francisco; J. V. Quigley, Oakland—all in California. Principal office, San Francisco, California. To import rubber and build factories for making rubber goods.

Cotton States Rubber Mfg. Co., May 11 (Georgia), $500,000. J. B. Anchors; R. W. Ragin; G. J. Reuter—all of Atlanta, Georgia. Principal office, Atlanta, Georgia. To manufacture and sell all kinds of mechanical rubber goods.

Culp, Inc., George K., March 17 (Delaware), $5,500,000. G. K. Culp, president; C. C. Dobbs, treasurer. Principal office, 56 West 45th street, New York, N. Y. To supervise and finance the production of "Culp" tires.

Daggett Co., Inc., H. A., May 26 (New Jersey), $100,000. C. A. Cole, Hackensack; R. A. Van Voorhis, 77 Oak street, Jersey City—both in New Jersey. A. R. Oakley, Pearl River, New York. Principal office, 15 Exchange Place, Jersey City, New Jersey. To deal in crude rubber, gutta percha, etc.

Exclusive Rubber Clothing Co., Inc., May 24 (New York), $5,000. S., J. and L. Inker—all of 934 East 181st street, New York, N. Y.

Friant Rubber Co., C. H., March 19 (Maryland), $50,000. C. H. Friant, president; C. P. Thompson, vice-president; A. T. Knieling, secretary and treasurer—all of Baltimore, Maryland; C. Hess, Jr., vice-president, Philadelphia, Pennsylvania. Principal office, 417 West Franklin street, Baltimore, Maryland. To deal in rubber goods.

Goodyear Tire & Rubber Co., The, May 12 (Ohio), $41,010,000 capital stock and 1,500,000 shares no par value. H. B. Manton, D. E. and G. R. Hill, S. H. Miller and F. A. Seiberling. Principal office, Akron, Ohio. Reorganization.

Gordon Pen Corporation, William, May 20 (Delaware), $1,000,000. Delaware agent, United States Corporation Co. To manufacture stylographic and fountain pens.

Hones Tire & Auto Repair Co., Inc., June 21 (New York), $10,000. C. A. and C. J. Hones, both of Baldwin; R. L. Rogers, 234 Franklin street, Hempstead—both in New York. Principal office, Baldwin, New York.

Hoosier Rubber Co., March 15 (Indiana), $150,000. T. Nicar, president; G. B. Britton, secretary; N. V. Robertson, treasurer. Principal office, Mishawaka, Indiana. To manufacture "Service" rubber heels.

Houston Wheel Sales Corporation for New York and New Jersey, March 8 (New York), $10,000. J. M. Grant, president; C. A. Holstein, vice-president; H. S. Gay, vice-president; A. S. Jameson, secretary; J. P. Trant, treasurer—all of 120 Broadway, New York, N. Y. Principal office, 120 Broadway, New York, N. Y. To sell the Houston puncture-proof pneumatic wheel.

International B. F. Goodrich Corporation, The, May 21 (New York), $10,000. B. G. Work, president; W. C. Arthur, vice-president; F. C. Van Cleef, secretary; L. D. Brown, treasurer; H. Hough, comptroller; F. E. Titus, director of sales; W. H. Allen, director of manufactures. Principal office, 1780 Broadway, New York, N. Y. To manufacture and sell tires, rubber footwear, surgical rubber goods, etc.

Lake Erie Rubber Products Co., March 4 (Ohio), $50,000. L. H. Irwin, president; J. W. Lawrence, vice-president, treasurer and general manager; M. Jenkins, secretary. Principal office, 632 Frankfort avenue, N. W., Cleveland, Ohio. To distribute tires, etc.

Lambert Trublpruf Cord Tire Co., March 9 (California), $10,000. R. H. Ingram, president; A. V. Ingram, vice-president; R. L. Hepler, secretary and treasurer. Principal office, 1408 Market street, San Francisco, California. To distribute tires, etc.

Paul Rubber Co., April 4 (North Carolina), $250,00b. M. L. Miller; W. J. McDaniel; E. C. Brainard—all of Salisbury, North Carolina. Principal office, 310 Wallace Building, Salisbury, North Carolina. To manufacture tires and other rubber products.

Pneumatic Rubber Heel Corporation of America, May 19 (Delaware), $250,000. W. Webster; H. F. Herbermann; B. Lockwood. To manufacture rubber soles.

Puncture Proof Tube & Supply Co., April 18 (West Virginia), $100,000. W. R. L. Croft, Christiansburg, Virginia; W. A. Creager; R. W. Newton, both of Northfork; T. Miller, Elkhorn; J. J. Huddleston, Algoma—all of West Virginia. Principal office, Northfork, West Virginia. To manufacture automobile tubes and other rubber products.

Ruberoid Co., Inc., June 11 (New York), $5,000. H. Abraham; H. F. Gillespie; F. Jellenik—all of 95 Madison avenue, New York, N. Y. To manufacture roofing, insulating materials, etc.

Security Rubber & Belting Co., March 1 (Illinois), $100,000. H. E. Dennie; C. M. Burnam; J. W. Mowrey—all of Chicago, Illinois. Principal office 2837 South La Salle street, Chicago, Illinois. To distribute rubber belting.

Universal Tire Co., January 7 (Delaware), $7,500,000. G. W. Odell, president; J. G. Burns, vice-president; R. Ackerman, treasurer; S. G. Murphy, secretary. Principal office, Philadelphia, Pennsylvania. To manufactue and sell, through its own chain stores, automobile tires and tubes.

Universal Tires Limited, March 8 (Canada), $50,000. L. M. Lymburner, president; E. P. Bertrand, secretary and treasurer; G. Bertrand; F. H. Lymburner; M Lussier; directors. Principal office, 209 Park avenue, Montreal, Quebec, Canada. To distribute Kelly-Springfield tires.

Wire Cord Co., May 26 (Delaware), $1,000,000. T. L. Croteau; M. A. Bruce; C. H. Maxwell—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, duPont Building, Wilmington, Delaware. To manufacture and deal in crude rubber, gutta percha, etc.

DIVIDENDS DECLARED

Company	Stock	Rate	Payable	Stock of Record
Apsley Rubber Co.	Pfd.	3½% s.a.	July 1	June 27
Boston Woven Hose & Rubber Co.	Com.	1½% q.	June 15	June 1
Boston Woven Hose & Rubber Co.	Pfd.	3% s.a.	June 15	June 1
Brunswick-Balke-Collender Co.	Pfd.	1¾% q.	July 1	June 20
Canadian General Electric Co.	Com.	2% q.	July 1	June 15
du Pont de Nemours & Co., E. I.	Com.	2% q.	June 15	June 4
du Pont de Nemours & Co., E. I.	Deb.	1½% q.	July 25	July 9
General Electric Co.	Com.	$2 q.	July 15	June 8
General Electric Co.	Stk.	2% s.a.	July 15	June 8
Kelly-Springfield Tire Co.	6% Pfd.	$1.50 q.	July 1	June 17
United Shoe Machinery Co.	Com.	$0.50 q.	July 5	June 14
United Shoe Machinery Co.	Pfd.	$0.37½ q.	July 5	June 14
Westinghouse Electric & Manufacturing Co.	Com.	2% q.	July 30	June 30
Westinghouse Electric & Manufacturing Co.	Pfd.	2% q.	July 15	June 30

AKRON RUBBER STOCK QUOTATIONS

The following are closing quotations of June 18, supplied by The App-Hillman Co., Second National Building, Akron, Ohio:

	Bid	Asked
American R. & T. Co., com.	..	40
Amazon Rubber Co., The	..	15
Firestone T. & R., com.	50	55
Firestone T. & R., 6% pfd.	75	79
Firestone T. & R. 7% pfd.	55	60
General T. & R. Co., The, com.	..	200
General T. & R. Co., The, 7% pfd.	75	85
Goodrich, B. F., The, com.	31	33
Goodrich, B. F., The, pfd.	66	70
Goodrich, B. F., The, 5-yr. 7% notes	89	90
Goodyear T. & R. Co., The, com.	8	8½
Goodyear T. & R. Co., The, 7% pfd.	22½	23½
India T. & R. Co., com.	..	90
India T. & R. Co., 7% pfd.	60	70
Mason T. & R. Co., The, com.	11	13
Mason T. & R. Co., The, 7% pfd.	45	50
Marathon T. & R. Co., com.	2½	3½
Miller Rubber Co., The, com.	40	50
Miller Rubber Co., The, 8% pfd.	45	52
Mohawk Rubber Co., The	..	95
Phoenix Rubber Co., com.	..	15
Phoenix Rubber Co., pfd.	..	80
Portage Rubber Co., The, com.	3	8
Portage Rubber Co., The, 7% pfd.	5	12
Republic Rubber, com.	¼	½
Republic Rubber, 7% pfd.	5	9
Republic Rubber, 8% pfd.	3	4
Rubber Products Co., The	..	50
Standard Tire Co., com.	..	90
Standard Tire Co., pfd.	..	85
Star Rubber Co., com.	..	90
Star Rubber Co., 8% pfd.	..	100
Swinehart T. & R., com.	20	40
Swinehart T. & R., 7% pfd.	..	70

NEW YORK STOCK EXCHANGE QUOTATIONS

JUNE 22, 1921

	High	Low	Last
Ajax Rubber Co., Inc.	22	21¾	22
The Fisk Rubber Co.	12¼	11⅝	12
The B. F. Goodrich Co.	30¼	29½	30
The B. F. Goodrich Co., pfd.	66½	66½	66½
Kelly-Springfield Tire Co.	37¼	31¾	36½
Keystone T. & R. Co., Inc., The	9½	9⅛	9½
Lee R. & T. Corporation	48	47⅛	47¾
United States Rubber Co.	58	55⅛	57
United States Rubber Co., 1st pfd.	93	91⅛	92

SALES MANAGER, KELLY-SPRINGFIELD TIRE CO.

JOHN VAUGHAN MOWE, general sales manager of the Kelly-Springfield Tire Co., New York, N. Y., was born at Oconomowoc, Wisconsin, in 1875. Following his graduation from high school in 1893, he entered mercantile business as stockyard representative for a firm manufacturing wooden ware.

JOHN V. MOWE

His first association with the rubber industry was with the Firestone Tire & Rubber Co., for which firm he served eight years as branch manager at Detroit, Michigan, also traveling extensively throughout the United States and becoming well acquainted with tire dealers. In 1913, he resigned to join the Goodyear sales force as special representative, doing special work among the branches, and selling to large manufacturers. Two years later, he was appointed assistant general sales manager of the Kelly-Springfield Tire Co., in which capacity he also traveled extensively, especially the western territory. Last year he was promoted to general sales manager, succeeding Otis R. Cook, who continued with the company as a director.

Outdoor sports claim Mr. Mowe's spare moments, and his clubs include the Lawrence Park Golf Club, Detroit Athletic Club and Lotos Club of New York City.

SMITH CHEMICAL & COLOR CO., INC., MOVES TO NEW QUARTERS

The Smith Chemical & Color Company, Inc., has removed from 116 Nassau street to 257-259 Water street, New York, N. Y., where the enlarged offices and warehouses are located. Here the company will be able to give more efficient service to users of rubber chemicals, colors and pigments. A laboratory is now being equipped in the new building, where all products will be tested, matched and reported upon.

Casper Smith, president and general manager of the company, has been largely instrumental in promoting the development of the company, and is very popular in the trade.

A SWINDLER ANNOYS NEW YORK RUBBER TRADE

An imposter purporting to be Osman Shaw, of Francis Shaw & Co., Limited, Manchester, England, is operating in New York City, and members of the rubber trade are warned to be on their guard. The imposter does not call at the office of the intended victim but telephones requesting a business meeting at some prominent hotel. This being denied, considerable persistence is shown, but the matter is dropped if a meeting at the hotel cannot be arranged. Amedee Spadone, assistant secretary of the Gutta Percha & Rubber Manufacturing Co., 126 Duane street, knew that Mr. Shaw was in England, confirmed the fact by cable and ignored the swindler.

THE RUBBER TRADE IN THE EAST AND SOUTH

By Our Regular Correspondent

NEW YORK

THE executive offices of the Powertown Tire Sales Co. have been removed from Buffalo to 253-259 East avenue, Rochester, New York. The Buffalo office, 955 Main street, is being continued as a factory branch, with George H. Holmes as manager. This company reports an encouraging growth in its volume of sales, each month this year showing an increase over the previous month. N. D. Johnson is president.

At a recent meeting of the stockholders of the Hudson Tire & Rubber Corporation, Yonkers, N. Y., the following officers were elected: William M. Doucette, president; Harry B. Seymour, vice-president and treasurer; Ulrich Wiesendanger, secretary. The three directors of the company were reelected. The firm was incorporated April 19, 1920, with a capitalization of $1,000,000. New factory buildings, now under construction, will be completed this summer.

Because of increasing business the Hewitt Rubber Co., Buffalo, N. Y., recently moved its eastern district branch from No. 245 to Nos. 236-238 West 55th street, New York, N. Y. At this branch they intend to carry a larger stock, not only of tires, but also of various mechanical goods. J. R. Benedict, eastern district manager, will make his headquarters here.

The Tropical Rubber Co., Inc., 365 Broadway, New York, N. Y., has entered into contract to purchase a $100,000 bond issue of the Smith Rubber & Tire Co. The recently completed plant of the latter firm is located at Garfield, New Jersey. The $100,000 issue in question is secured by a mortgage and deed of trust on the plant, equipment and business of the Smith Rubber & Tire Co. The officers of the Tropical Rubber Co. are: George V. S. Williams, president; H. W. Van Alen, treasurer; F. C. Woods, secretary.

Instead of sales manager, as was recently stated, Lowell H. Low has been appointed branch manager of the Swinehart Tire & Rubber Co., 631 West 57th street, New York, N. Y. The general offices of the company are at Akron, Ohio.

The New England Tire & Rubber Co., is now maintaining at 43 East 47th street, New York, N. Y., a factory branch, under the name of the Holyoke Cord Tire Co. The company claims that its prospects for the future are excellent, judging from its business of the last three months. S. R. Huntley is general manager.

The Nathan Novelty Manufacturing Co., incorporated as the Nathan Anklet Support Co., has increased its capital from $18,000 to $150,000. Edwin B. Nathan is president of the company. The offices are at 55 Fifth avenue, New York, N. Y.

The New York office of Fred Waterhouse Co., Limited, at 82 Wall street, is in charge of J. C. Holmes as manager. The business is entirely confined to crude rubber and is operated on a commission basis. Mr. Waterhouse, who has been in this country several weeks, left late in May for Singapore via Honolulu, Hawaiian Islands.

Stephen M. Mullin, under the firm name of S. M. Mullin & Co., has established a crude rubber brokerage business at 35 Nassau street, New York, N. Y. Mr. Mullin is familiar with all branches through fifteen years of active experience with various large importers and dealers. For a time he acted as New York agent for one of the foremost shippers in Amsterdam, Holland, and subsequently managed the affairs of Hammesfahr & Co., crude rubber brokers.

John M. Ball, formerly chemical engineer with the Manhattan Rubber Manufacturing Co., Passaic, New Jersey, has taken up sales work with the R. T. Vanderbilt Co., 50 East 42nd street, New York, N. Y., manufacturer of compounding ingredients for the rubber trade.

The firm of Mac Namara & Wadbrook, Inc., 136 Liberty street, New York, N. Y., crude rubber brokers, will be dissolved, and Alfred B. Mac Namara and Elston E. Wadbrook will continue in business at the same address, but as separate individuals.

The Achilles Rubber & Tire Co., Binghamton, New York, is now running full force as it has been for three years past. A new power house is now under construction, and new vulcanizing and shipping rooms and a warehouse are to be added, increasing the capacity next year to 1,000 tires a day.

PENNSYLVANIA

As advertising and sales promotion manager Andrew W. Crawford has become connected with the H. H. Robertson Co., First National Bank building, Pittsburgh, Pennsylvania. Mr. Crawford has had previous experience in sales and factory work with several other companies.

The Firestone Tire & Rubber Co., Akron, Ohio, has placed L. L. Evans in charge of truck tire sales at Philadelphia, Pa.

Incorporated for the purpose of repairing tires and selling rubber goods, the New Kensington Tire & Rubber Co., 735 Fifth avenue, New Kensington, Pennsylvania, was organized August 17, 1920, with a capitalization of $10,000. The officers are: A. E. Greenwald, president; Charles E. Moore, vice-president; H. S. Douglas, secretary and treasurer; Fred La Mountain, manager.

C. E. Pumphrey, formerly sales manager of The McGraw Tire & Rubber Co., has become sales manager of the Corona Cord Tire Co., East Butler, Pennsylvania, manufacturer of cord tires and inner tubes marketed exclusively through wholesale channels. Mr. Pumphrey's experience in the tire business dates from 1910, when he was with the Goodyear selling organization.

A wireless communication service for the transaction of company business is being established at the several plants of the Westinghouse Electric & Manufacturing Co. Service between the plant at East Pittsburgh, Pennsylvania, and the foundry at Cleveland, Ohio, was formally opened on May 31, and stations are being installed at the Newark, New Jersey, and Springfield, Massachusetts, works.

SOUTHERN NOTES

The Sterling Carbon Co., Inc., Shreveport, Louisiana, reports that the present officers of the company are: O. A. Wright, president; N. C. McGowan, vice-president and treasurer; E. J. McGowan, Jr., secretary. The firm was chartered October 17, 1919, under the laws of Louisiana. The company's plant is located at Sterlington, in that state.

The recently erected plant of the Louisiana Carbon Co., near Monroe, Louisiana, on the Missouri Pacific railroad, is now in full operation. The company manufactures carbon black, gasoline and other by-products from natural gas. The company was chartered August 6, 1920, with the principal office at Clarksburg, West Virginia. The authorized capital stock is $100,000. The officers are as follows: Lynn S. Hornor, president; H. G. Evans, vice-president; Percy Byrd, treasurer; Philip P. Steptoe, secretary, and G. A. Williams, general manager.

PURCHASE OF NEW CASTLE RUBBER CO.'S PLANT

The New Castle Rubber Co. at New Castle, Pennsylvania, was purchased May 27, at receiver's sale, by R. C. Ellsworth of Akron, private secretary to F. A. Seiberling, former president of The Goodyear Tire & Rubber Co. It is reported that Mr. Ellsworth bid in the plant as the representative of Mr. Seiberling, who also attended the sale. The plant is valued at over $500,000. The sale price was $103,500.

F. A. Seiberling held a controlling interest in the New Castle Rubber Co., purchased over a year ago. It is stated that the purchase of the plant through Mr. Ellsworth does not mean that Mr. Seiberling will again become actively engaged in the rubber industry. The New Castle plant underwent extensive development a year ago and now includes two large factory buildings, new modern office buildings, several dwellings and seven and one-half acres of ground.

THE RUBBER TRADE IN NEW JERSEY

By Our Regular Correspondent

MISCELLANEOUS NEW JERSEY NOTES

THE New Jersey Fire Chiefs' Association has endorsed a standard thread for fire-hose couplings in order that one municipality may aid another in case of fire. The hose with a diameter of 3 1/16-inches and with 7½ threads to an inch, which is said to be the standard set by the United States Government, was selected.

The Firestone Tire & Rubber Co., which sold its modern three-story and basement building at Broad and Kinney streets, Newark, to the Federal Drug Co., will use the upper floors of the building as a distributing and service station for Northern New Jersey. This arrangement will cover a period of seven years.

The United Auto Stores, Inc., will shortly open a branch at Burlington, with John K. Gunn as manager. The company operates a chain of forty-five stores in various parts of the country and handles standard tires and automobile accessories.

The Lambertville Rubber Co., is operating only on part time. The boot department is being run but three days a week, while men are employed in the main calender room five days a week. The department where balls are made has been closed and there are but few at work in the rubber-band room.

The New Jersey Rubber Co., Lambertville, manufacturer of reclaimed rubber, is running on part time only. The concern is owned by the E. H. Clapp Rubber Co., of Boston.

The plant of the Stockton Rubber Co., Stockton, New Jersey, which went into the hands of a receiver some time ago, has been closed.

Joseph H. Dwork, inventor of an automobile tire for which he received 2,500 shares worth $25,000 from the Ideal Wheel & Tire Co., Newark, New Jersey, organized for the manufacture of the product, will receive $2,000 for his interest. In an opinion filed by Vice-Chancellor Backes, it appears that Dwork is entitled to the fund remaining after creditors have been paid by the receiver, Charles Frankel. The firm became insolvent some time ago. A war embargo on rubber prevented exploitation of the invention, it was said, and the company turned to the repair of tires instead. It was contended that Dwork was not entitled to a dividend on the surplus because the patent was not assigned. Dwork was originally half-owner of the company.

TRENTON NOTES

The Miller-Steiner Rubber Co., of 678-694 North Olden avenue, has recently been incorporated with an authorized capitalization of $100,000, divided into 1,000 shares of the par value of $100. The incorporators are George W. Page, 1438 Brunswick avenue; John H. Miller, 1845 Greenwood avenue, and Julius D. Steiner, 101 West End avenue. The new company has taken over the plant of the Olden Rubber Co. Operations will begin shortly upon completion of alterations and installation of new machinery. Mechanical rubber goods and specialties will be manufactured. Mr. Miller, president of the company, will also be general manager, and will be assisted by Mr. Steiner. Both have had extensive experience in the rubber industry, having been connected for a number of years with the Empire Rubber & Tire Corporation and other rubber plants. Mr. Page, who is one of the Trenton city commissioners, holds an inactive interest with the company. The

Olden Rubber Co. was organized several years ago by Israel H. Albert.

The scrap rubber plant of Samuel Kravitz, New and Union streets, was recently destroyed by fire, causing a loss of about $30,000. Spontaneous combustion is the cause advanced for the blaze, the fire having started in bales of rubber at the foot of the elevator shaft.

Colonel Washington A. Roebling, who recently passed his eighty-fourth birthday, has been elected president of John A. Roebling's Sons Co., Trenton, N. J., wire rope manufacturer, succeeding his nephew, Karl G. Roebling, whose obituary appears in this issue. Colonel Roebling has long been identified with bridge construction. His most notable achievement was the completion of the Brooklyn Bridge.

Joseph S. Papier, who conducts two automobile tire stores in Trenton, has purchased the building he occupies at 15 East Front street and will greatly enlarge the place. Mr. Papier is the Trenton representative for the Pennsylvania vacuum cup and Lee puncture proof tires.

The Thermoid Rubber Co. has erected a frame office adjoining its plant on East State street, Trenton, to make more room for the additional force. The company was its own contractor and builder.

The Hamilton Rubber Manufacturing Co. is installing larger and heavier machinery at the plant in East Trenton, in an addition 36 by 6 feet being erected for the purpose.

The property now occupied by the Universal Tire & Tube Market, 249 North Broad street, Trenton, has been sold and the concern is seeking new quarters.

W. E. Saunders, of the Essex Rubber Co., Trenton, recently addressed the members of the Trenton Shoe Club. He explained to them the manufacture and uses of rubber as applied to shoes and the various processes through which rubber passes before it is finally made into soles and heels.

MISCELLANEOUS NEW JERSEY NOTES

The Sterling Tire Corporation, Rutherford, New Jersey, has recently opened a direct factory branch at 1509 South Michigan avenue, Chicago, Illinois. At this plant a full stock of tires and tubes will be carried, and an attempt will be made to reach from this point the entire West. Elmer Williams will have the supervision of the branch and will act as western sales manager. Mr. Williams was formerly district manager for the Rubber Corporation of America at Chicago, Illinois.

THE RUBBER TRADE IN RHODE ISLAND

By Our Regular Correspondent

REDUCTIONS in manufacturers' tire and tube prices, ranging from 10 to 25 per cent according to the grade and make, have caused a price readjustment among the retailers and dealers here that has been very noticeable. As these revisions bring tire costs to the consumer almost to a level with the pre-war schedules, there has been a very perceptible stimulation of business. Not only has there been a noticeable increase in sales but the dealers are showing a disposition to stock somewhat more heavily than has been the case before in many months.

Relative to the boot and shoe industry, little can be said. There is no market and all the mills are either shut down entirely or running on such a short schedule as to be practically nil. This is the rule rather than the exception and there is apparently little prospect of any material betterment for some time to come. Several of the larger plants have endeavored to operate on a short schedule so as to maintain the unity of the working forces, but this has been found to be utterly impossible.

The plants that are producing druggists' supplies, novelties and other articles of rubber are doing something although not being operated to the full capacity of their equipment. But even with these departments there is comparatively little enthusiasm and the operations are almost hand to mouth, orders being cleared up almost as rapidly as they are booked.

With this lethargy in rubber manufacturing lines a corresponding dullness is carried into the textile and fabric plants that furnish these goods for various purposes of the rubber industry. Some of the mills that are producing textiles for tire fabrics are moderately busy but none are being operated to a sufficient degree to burden them to any extent. There is a generally optimistic feeling among these manufacturers although it can hardly be called very enthusiastic. A general revival in other businesses would unquestionably be substantially reflected in an increased activity in the tire business and its accessories and supplies. Everybody is ready and waiting and the millennium cannot come too quickly to suit both employer and employe.

The American Wringer Co. deficit of $317,998.64, reported recently by the Industrial Trust Co., Providence, as receiver for the wringer corporation, brought no pleasure to the latter's stockholders. It was the first statement after the appraisal of assets and liabilities of American Wringer as of January 26, 1921, the date of the appointment of the Industrial Trust as temporary receiver. The plant and inventory were revalued by Lockwood, Greene & Co. as of January 26 and the items approved were $306,059.22 below their original book values. The wringer concern's condition is not as favorable as was hoped by the more sanguine among its stockholders and friends.

Total claims of merchandise creditors filed at the time the statement was made up aggregated about $600,000, and outstanding creditors' claims on notes held by banks foot up about $835,000. It will require a later report for the consideration of and decision on the claims of creditors. Also, there are accrued taxes and wages to be satisfied. Orders booked for wringers were about one-third normal for the first four months of the present year. The company's installment business, perhaps, was not a happy idea, and there was much of it, and too little working capital.

Following are the principal items of the balance sheets of American Wringer, as of January 26, 1920 (furnished by the company itself), and as of January 26, 1921 (furnished by the receiver). On the former date the assets and liabilities balanced at $2,471,027.37 and on the latter at $2,944,563.82. Real estate, machinery and fixtures were given separately, a year ago, and "bunched" this year. The capital stock remained at $1,750,000. "Patents, trade marks and good will" would not seem to be very valuable as a market asset to a concern thus situated, but comparison of the items selected, as below, may be of interest:

	January 1, 1920	January 26, 1921
ASSETS		
Plant, etc.	$823,253.51	$940,852.00
Merchandise	934,157.79	1,027,133.02
Cash	95,766.31	165,479.35
Investments	153,215.75	22,705.00
Notes Receivable	37,059.11	41,181.04
Accounts receivable	312,569.19	300,779.92
Patents, etc.	110,978.71	111,257.21
LIABILITIES		
Accounts payable	$126,277.37	$342,865.24
Notes payable	475,000.00	842,000.00
Surplus	90,000.00	*317,998.64

*Deficit.

The company had, as of January 26, 1921, contingent liabilities of $95,470.95 for notes discounted and its "cash" includes $10,362.15 on deposit in Europe, at par of exchange.

John F. Sweeney, for 32 years with the American Wringer Co., Woonsocket, and for the past six months plant manager, severed his connection with that corporation on June 10. He has been succeeded by George R. Keltie, the following notice having been posted, signed by William G. Roelker, secretary of the Industrial Trust Co., receiver for the American Wringer Co.: "George R.

Keltie has this day been appointed plant manager. George Schlosser will continue in charge for the receivers."

Mr. Sweeney had served in many capacities, both in the clerical and administrative departments of the company. He entered its employ as a clerk in the office force and for 16 years was manager of the cost department. In 1916 he was in charge of the mechanical roll department and was also purchasing agent. He was promoted to assistant plant manager in 1918, a position which he filled until his appointment as manager on January 1, 1921. For many years he was one of the executive assistants of the late Michael Flynn, general manager. The new plant manager has been employed at the plant for about a year in an executive capacity.

Closing exercises of the Americanization School at the factory of the National India Rubber Co., at Bristol, were held at 4 o'clock in the afternoon, June 15, in the conference room of the plant. The exercises were in charge of Miss Marguerite L. MacDonald, one of the teachers. The pupils to the number of 115 were present. An excellent program of vocal and instrumental music and recitations was rendered by the pupils. In the evening the pupils and guests enjoyed a complimentary entertainment at the rooms of the Y. M. C. A. The program included six reels of patriotic and instructive pictures, as well as comedy films and vocal and instrumental music. A collation was served and the latter part of the evening was devoted to dancing in the gymnasium.

At the Revere Rubber Company plant on Valley street on the evening of June 7 a presentation was made by the Colt plant employes to the factory manager, John J. Shea, on the occasion of the anniversary of his fiftieth birthday. The presentation consisted of a gold Waltham watch and a bouquet of fifty roses. The employes assembled in the cafeteria immediately after work and sat down to a buffet luncheon served by the factory steward. Seated at the head table with Mr. Shea were George W. Seiberling, of Detroit, general factory manager of the United States Tire Co.; Dr. E. Meyer, consulting chemist; Arthur Carr, factory manager of the Revere Rubber Co., mechanical division; J. T. Brogden, superintendent of the Revere Rubber Co.; F. O. Miles, treasurer of the Revere Rubber Co.; A. P. Delahunt, treasurer of the Colt plant, and W. T. Mead, engineer.

The presentation was made on behalf of the employes by Walter C. Eaton, Mr. Shea responding. Brief remarks were made by Messrs. Seiberling, Carr, Brogden, Mead, Miles and Delahunt and Dr. Meyer. The luncheon was followed by dancing. The committee in charge of the arrangements comprised L. B. Martin, superintendent; George V. Burgess, divisional superintendent; Gus Mix, divisional superintendent; Richard Newsmith, mechanical engineer; Samuel Reed, cashier; Miss M. Kilroe and Miss E. Moore; Oliver Hopkins, industrial relations manager; S. D. Johnson, employment manager, and Walter C. Eaton, chief cost accountant.

Out of the several hundred old graduates who returned June 15 to attend the 131st annual commencement exercises at Brown University interest centered in two, both of whom have served as Chief Executive of two of the most important states in the Union. One of them, Secretary of State Charles Evans Hughes, gave the glamor of renewed achievement to his fellows of the class of '81. The other, the Honorable Augustus O. Bourn, of Providence, president of the Bourn Rubber Co. and a former governor of Rhode Island, came as the only representative of the class of '55, the oldest that responded to the roll-call. Both men have helped mold the history of their country, the first as a jurist and the most important officer in the President's Cabinet; the second as a boy soldier in Dorr's Rebellion (Rhode Island's political war), who later guided his native state through trying days.

Michael J. Bowes, who has been with the Lawrence Felting Co. for 26 years, and for the last few years superintendent of that company's mills at Millville, has tendered his resignation to the United States Rubber Co., operating the Millville plant, which was originally the Bannigan & Bowes Felting Co., formed in 1876. The late William Bowes, father of Michael Bowes, was the first superintendent. Francis Sage, of the Hastings (Michigan) Wool Boot Co., succeeds Mr. Bowes.

THE RUBBER TRADE IN MASSACHUSETTS

By Our Regular Correspondent

WITH the tire buying season in full swing, automobile manufacturers stimulating new business by generous price reductions, and tire manufacturers selling at the new list prices, which represent reductions of 10 to 20 per cent, the tire demand is now fair and improving. Production averages about two-thirds normal with a few plants very close to normal production.

Apart from the seasonable demand for jar rings and garden hose, business in mechanical rubber goods continues quiet and will pick up only with a resumption of general manufacturing. This applies particularly to belting and packing. Stationers' sundries are affected somewhat by the same causes. The demand for insulated wire has been satisfactory because of the great amount of extension work deferred by the war.

The proofing trade is quiet, especially auto-top material, although it is anticipated that increasing sales of cars will enlarge the demand. The call for raincoat materials is better. Druggists' sundries sales are improving, but large orders cannot be expected until fall, when jobbers generally replenish their stocks. While reclaimers view the falling crude rubber market with some uneasiness, they find that compounders still prefer for certain purposes some of the well-known brands of reclaim with which they are familiar, and anticipate an increasing demand as rubber goods manufacture returns to normal. Moreover, they believe that a rise in crude rubber prices when general buying commences, after stocks and commitments have been exhausted, will favor them. Business in heels and soles is good, and in these much reclaim is used.

The canvas footwear season is at its height and the demand most gratifying. Manufacturers report constant small orders from jobbers and large dealers which call for all that can be produced. In rubber footwear there is little activity.

A shortage of light rubber footwear this coming winter is predicted by those in close touch with the trade. Retailers are not placing future orders as usual, but are relying upon jobbers to carry their stocks for them. Jobbers, however, are not inclined to carry more than minimum stocks this year, and their orders to manufacturers are smaller than ordinary. Manufacturers are not inclined to carry sufficient stocks to overcome the strong buying aversion of both retailers and jobbers, and are making up few goods in excess of actual orders despite the certainty that the situation will create a shortage.

The same conditions existed to a lesser degree regarding canvas footwear during the normal season for accumulating stocks, with the result that a shortage is already being felt in the more popular numbers, while most manufacturers have orders for all the canvas footwear that can possibly be produced for the balance of the season.

Rubber footwear conditions are more acute, however. Normally it takes about nine months to manufacture the rubber footwear used in three months. Were every retailer to order at once for normal requirements, it would still be impossible to meet the demands of a winter of average severity, and another mild winter is hardly to be expected. While the abnormal weather last winter left retailers with some stocks of rubber footwear on hand, one good storm in December would exhaust them.

Owing to tight money, the burden of financing footwear stocks has been passed along to the manufacturer, and as he cannot bear it in full and alone, all suffer in loss of business while a considerable percentage of the buying public must go without the protective footwear it wants and needs. Merchants with the foresight to stock amply will probably reap a harvest this coming winter.

BOSTON NOTES

The Associated Tire Corporation, 1041 Commonwealth avenue, Boston, has become Massachusetts distributer for Kenyon cord tires, manufactured by the C. Kenyon Co., Brooklyn, New York. Sales already run ahead of the most sanguine expectations.

Free service, free storage and free delivery are features of the day and night quick service being rendered to patrons at the large service station of the Grow Tire Co., 323 Columbus avenue. Experts are ready to advise regarding every tire difficulty. A business man may drive his car to the service station in the morning. A chauffeur will drive him to his office while his tires are being changed, and later when ready, his car will be sent to his office at his convenience.

The Burditt & Williams Co., 160 Federal street, has become factory distributer for the Ashland cord tire.

The Detroit Waterproof Fabrics Co., of Detroit, Michigan, has opened a Boston office at 166 Essex street, in charge of John H. Foster, formerly in the Boston office of the United States Rubber Co.

J. E. Driscoll of Savannah, Georgia, has recently become a vice-president, handling sales, with H. T. West Co., 148 State street, Boston, Massachusetts. Mr. Driscoll was formerly, for many years, manager of the domestic department of the American Naval Stores Co. H. T. West Co. handles naval stores, petroleum products, linseed oil and supplies for technical industries.

The New England distributing point for the Achilles Rubber & Tire Co., Binghamton, New York, is now located at 679 Beacon street, Boston. Max Leitman is in charge.

On the evening of May 26 about 125 employes of the United States Rubber Co. offices in Boston held a dinner and dance at the Hotel Westminster. George Bailey was toastmaster and the speakers included John White, James Ryan, Charles Abbott and J. J. Brady. The firm was represented by William North, general manager, and M. R. Coe. Department bowling prizes were awarded.

MISCELLANEOUS MASSACHUSETTS NOTES

The Middlesex Rubber Co., Reading, which was incorporated late in March with a capital of $50,000, has occupied the plant formerly operated by the McTernen Rubber Manufacturing Co., and is making druggists' sundries, automobile inner tubes, and rubber bands. George E. Jeandheur, at one time superintendent of the Mayflower Rubber Co. plant, is president and treasurer, while Michael Culliney is vice-president.

With 27 per cent of the population of Massachusetts foreign born, progressive industrial establishments have seen the need of Americanization work among employes and met it. Among the concerns which recently held special closing exercises for their English and citizenship classes were the American Rubber Co., Cambridge, and the General Electric Co., West Lynn. It has been gratifying to note at those exercises the apparent readiness with which graduates use our language and the marked progress in writing ability.

Believing that the only way New England can maintain her industrial leadership is to lead in the field of human relations, a conference of executives and managers was held on May 17 at the Copley Plaza Hotel to discuss employe representation plans. Some two hundred plant representatives were present to listen to five plans in successful operation, to ask questions and join in the general discussion.

Richard H. Rice, general manager of the Lynn plant of the General Electric Co., summed up the case for employe representation. Industrialists of the future, he declared, would bless those who had blazed the way in this movement for a closer relationship between employer and employe. The good results achieved through it for his company justified him in advising others to adopt similar measures.

Other speakers told how employe representation had enabled the companies to reduce wages and to readjust rates in keeping with the industrial depression and the reduced cost of living, with the consent of the workers and without the slightest friction—something that would not have been possible, it is believed, without such a system. There was also evidence that it had resulted in increased production, elimination of waste, and a general improvement in the morale of the working force.

The full bench of the Supreme Court recently ordered the Commonwealth of Massachusetts to refund to the Hood Rubber Co., Watertown, the sum of $2,250, which the court decided was illegally exacted in payment of excise taxes. The company changed its common stock of par value into an equal number of shares without par value. The tax commissioner then fixed par value for the latter and assessed an excise tax. The court holds that the unissued stock of no par value does not constitute an increase of capital and is not subject to excise tax.

MEETING OF THE RUBBER SECTION—NATIONAL SAFETY COUNCILS

The National Safety Council Convention will be held in Boston, September 26 to 30 inclusive. The sessions of the rubber section will be held September 28, 29 and 30, inclusive, in the historic State House in Boston, one of the most famous buildings in America. The tentative program is as follows:

FIRST DAY

1. Address of welcome by the chairman, E. H. Fitzgerald, Federal Rubber Co.
2. "Standard Statistics of the Rubber Industry," by Ray Watson, The Goodyear Tire & Rubber Co. Discussion.
3. "Fire Hazards and Static Electricity." Discussion.
4. General discussion on new ideas to promote safety in the rubber industry.

FIRST DAY EVENING

Luncheon. Toast master, Harrold T. Martin. The speaker is to be one of the most prominent men in the rubber industry. Special entertainment also to be provided.

SECOND DAY

1. Talk by one of the foremost rubber chemists in America. Subject to be selected. Discussion.
2. "Keeping a Rubber Factory Clean." Discussion.
3. Practical plans for medical supervision in rubber plants. Discussion.

THIRD DAY

1. Reports of Committees: Engineering Committee, C. B. Mitchella, The B. J. Goodrich Rubber Co.; Health Hazards Committee, C. F. Horan, Hood Rubber Co.; Membership Committee, E. W. Beck, United States Tire Co.; Program Committee, S. M. Schott, Morgan & Wright; Standards and Statistics Committee, Ray N. Watson, The Goodyear Tire & Rubber Co.
2. Talk by J. D. Anderson, factory manager, The Fisk Rubber Co. Subject: "Safety from the Factory Manager's Viewpoint."
3. Reclaiming plants and their efforts towards safe operation.

THE GOOD ROADS ESSAY CONTEST

Interest in the "Good Roads and Highway Transport" national essay contest for the Harvey S. Firestone scholarship appears to be greater this year than last, and it extends to all states and territorial possessions. In some states it is believed that 90 per cent of the high school pupils will submit essays, while many schools are making these essays the basis of final examinations

in English. The essays will be graded by local high school principals and state committees the same as last year. Essays may, however, be submitted direct to the Highway and Highway Transport Education Committee, Willard Building, Washington, D. C., if no local committee for grading the essays exists.

PRESIDENT OF THE GOODYEAR TIRE & RUBBER CO.

EDWARD G. WILMER, who succeeds Frank A. Seiberling as president of The Goodyear Tire & Rubber Co., Akron, Ohio, under the recent reorganization plan, was born in Milwaukee, Wisconsin, thirty-eight years ago and is unmarried. He studied law at George Washington University, Washington, District of Columbia, but never engaged in the active practice of law after obtaining his degree.

EDWARD G. WILMER.

Mr. Wilmer started his business career in the legal department of one of the Schlesinger companies, where he rose rapidly to personal adviser and legal representative of the late Ferdinand Schlesinger, of Milwaukee, Wisconsin, one of the most prominent figures in the American iron, steel and chemical industries. For the past twelve years Mr. Wilmer has been actively associated with a group of the Schlesinger companies controlling many subsidiaries, in all of which parent companies he held the office of vice-president. These include the Steel and Tube Co. of America, a consolidation of a dozen large concerns; the Newport Co., one of the largest chemical concerns in the world, and the Milwaukee Coal & Gas Co., which supplies gas to the city of Milwaukee.

For several years Mr. Wilmer has been engaged in reorganizing large companies. He is regarded as one of the keenest of the younger American business executives, particularly in financing, and his accession to the presidency of the second largest rubber company in the world is recognition of this remarkable ability. It is also significant of the entrance of the vast Schlesinger interests into a new field and a financial participation in the reorganization of the Goodyear company. With an assured free hand in the management, he will occupy a very prominent place in the rubber industry.

Mr. Wilmer's confidence in the future is concisely expressed in a simple statement made on assuming the presidency. Said he: "The entire Goodyear organization has shown unusual courage and efficiency in meeting all the recent difficulties. I am entirely satisfied with qualities so displayed, and with such an organization as this I firmly believe we are now ready for a complete come-back."

THE RUBBER TRADE IN OHIO

By Our Regular Correspondent

THE footwear season which has just closed was most satisfactory to Akron manufacturers in spite of the rather untoward reports regarding the industry in other sections of the country. Tabulations for the season have not been completed and figures are not available, but those closely connected with this feature of the industry believe that if the fall and early winter present seasonable weather the first of the coming year will find the books at least 100 per cent normal. The stocks of the dealers are reported to be comparatively low and although buying has been very good it is believed that the coming of cold weather will find much mail order business on its way to the factories from the dealers.

Druggists' sundries sales are gradually improving, according to available reports. The improvement lacks any spectacular features and is following along the lines noted in other industries. The season for actual placing of large orders does not come until fall, when the jobbers place their largest orders. Jobbers, however, are reported not to be heavily stocked with goods, and therefore the Akron druggists' sundries companies, including Goodrich, will be surprised if the coming season is not at least a fair one.

The future of mechanical goods depends largely upon the improvement in general business because these departments are closely interlocked with the larger manufacturing industries. The resumption of steel manufacture, the settling of labor and railroad freight rate questions, which are the large issues of the day, will mean that the general tone of business will improve and be reflected rapidly in the mechanical goods departments of the rubber companies.

While the news which developed in the Akron rubber factories toward the end of May lacked the optimistic tone which it carried during the first part of the month, June has been an entire reversal of this development. The opening of the month saw some changes which it was generally believed would inaugurate a new era of depression, but as the days and weeks went by reports from the various companies took on a more optimistic tone, until it is generally believed that the industry is on a firm keel and that sailing will be smooth in the future.

The Miller Rubber Co. has made some adjustments in office personnel and has announced that the factory will continue on a basis of 3,000 tires a day until fall, unless a change in business conditions makes it necessary.

At the Firestone plant it is officially stated that production is now between 17,000 and 18,000 tires a day and that if any reduction is made it will not take place on the basis of information now at hand. Few of the 47 automobile manufacturers who purchase original equipment from Firestone have materially decreased their commitments to date, it is stated. Some readjustments have been made in the Firestone office personnel in line with those made in other factories and some men have been laid off in the mechanical departments, but outside of this the forces are as they were in May.

The General Tire & Rubber Co. is running along at the same production point, although figures have not been given out. It is a conservative firm and was comparatively little affected by the big period of depression. It is generally believed that the price of General stock on the market reflects the condition of the company.

At the Goodrich plant, where salary and personnel adjustments have been under way, business remains very much as it was at the first of the month, which means a decrease from the peak reached during the middle of May. However, the adjustments have been to a large extent in the offices, while the production department has remained much the same. There has been no wholesale reduction in factory forces, as far as can be determined.

The B. F. Goodrich Rubber Co. announces the appointment of E. H. Fitch as director of sales, Diamond Rubber Co., with Ralph McPeake as his assistant. L. A. McQueen, formerly in sales promotion work, is now assistant advertising manager. T. A. Bennett has been given charge of Goodrich mechanical sales with E. R. Miller as his assistant.

A remarkable record for long-continued service is that furnished by three brothers, for many years employed by The B. F. Goodrich Co., Akron, Ohio. Perry and Lee Hall were first

employed by the Goodrich company in 1887. The first-named of the two is now manager of one of the plant departments. The third brother, Ira, has been with the company for twenty-five years. These men have seen many changes in their particular industry, while their united record, in years, represents almost a century of service.

Among the resignations from the Goodrich company is that of E. P. Rowen, formerly manager of Diamond tire sales, and also that of M. E. Fassnacht, formerly service manager.

E. C. Tibbitts, who for twenty-four years has been connected with Goodrich advertising, has accepted a position with the Wm. H. Rankin Co., Chicago, Illinois, as central western manager. Mr. Tibbitts will have personal charge of the Goodrich account as handled by the Rankin company, and will have headquarters in Akron.

F. O. Slutz, formerly manager of railroad sales, has been transferred to the tire department and will report to H. C. Miller, director of tire sales.

MASON ISSUES FAVORABLE REPORT

The Mason Tire & Rubber Co., Kent, Ohio, a short distance from Akron, has issued a series of reports regarding its business which have the most optimistic tone of any statements given out in Akron for several months. While the company did more than $7,000,000 worth of business last year, expectations based upon the present output of the plant, together with its output history thus far this year, leads officials of the company to believe that business this year will be in excess of $10,000,000. The balance sheet as of the first of May showed quick current assets of $3,340,000 as against current liabilities of $433,000, being a better than "four to one" condition.

While production of cord tires during the first weeks in June was larger than at any time in the history of the company, it is expected that the final figures on June production will be at least 100 per cent larger than production during the same month last year, when business as a whole was at peak. Sales for May of this year were in excess of those of May of last year. It is believed that by the end of the present month the company will have worked off the last pound of high-priced rubber and will begin July on rubber which costs an average of 16 cents a pound. Its fabric is manufactured in its own mills at Kent and consequently the company was not caught with large fabric commitments last year.

The company has practically stopped the manufacture of fabric tires except in Ford sizes, having turned attention primarily to the manufacture of cords. The same action has been taken as regards the manufacture of tubes. The company makes only a jet black tube, having discontinued entirely the production of grey and red tubes. At the present time arrangements are being made to discontinue the manufacture of a plain solid tire and to concentrate on cushion and slotted types of heavy duty solid tires.

The first part of July will probably see the absorption of the Mason Plantations Co. by The Mason Tire & Rubber Co. completed. The stockholders of the plantations company were given the privilege of converting their stock into rubber stock, and although no announcement has yet been made it is generally believed that the transfer suggestion has met with universal favor among the stockholders. When the amalgamation has been carried through, approximately $4,000,000 of liquid assets will be added to the company.

GOODYEAR ANNOUNCES NEW TIRE PRODUCTION SCHEDULE

The Goodyear Tire & Rubber Co. announces that the new production schedule will be 26,000 tires a day, and as soon as man can be obtained, the factory will be placed on a basis of three eight-hour shifts. This is due, not only to increases in dealers' orders, which have continued to grow for the past three weeks, but to unexpected increases in orders from automobile manufacturers.

When it was announced that 1,500 men were wanted immediately at the Goodyear factory it was believed to be impossible to find so many experienced men in the city. Goodyear started to rehire former employes the third week in June and the announcement that at least 1,500 more were needed came on June 23, following a conference between factory officials and E. G. Wilmer, the new president. Mr. Wilmer startled those who did not already know of the increase in orders by stating that it will soon be possible to go to 25,000 or 26,000 tires a day.

Goodyear's rapid recuperation is primarily due to the fact that during the worst days of the depression advertising was continued as before; and that the salesmen were recently placed upon a new working basis whereby they either produced results or resigned.

MILLER AND FIRESTONE PLAN INCREASED PRODUCTION

Although the same increases are not expected from the other companies it is known that Miller is contemplating an increase and Firestone has placed the small-tire production department on a basis of two nine-hour shifts.

Although it had been anticipated that automobile manufacturers' commitments at the rubber plants would be decreased with the reported decrease in automobile sales, yet this has not developed and in some instances facts have been just to the contrary. This is reflected in the orders to the Firestone Tire & Rubber Co.'s rim plant, which is now being operated at two-thirds capacity with 350 men. The plant makes more than 60 per cent of the automobile rims of the country, and during the past week the increased production at some of the automobile centers, especially at Flint, Michigan, has been definitely reflected at the rim plant.

AKRON NOTES

A price reduction on all types of truck tires is announced by The Goodyear Tire & Rubber Co., effective on June 20. These reductions will complete the stabilization of tire prices through the entire Goodyear line, following the reduction in price on all kinds of automobile casings and tubes announced last month. There will be an average reduction of 23½ per cent on 6, 7, and 8-inch cord pneumatic truck tires. The reduction on all Goodyear S.V. solid tires will average 12 per cent, and on all cushion tires there will be an average reduction of 10 per cent. The prices on pneumatic truck tires over eight inches, and on the new All-Weather tread solid tires have also been reduced to some extent.

The Goodyear Tire & Rubber Co. board of control has been replaced by George E. Einbecker, of Milwaukee, Wisconsin, who has assumed the office of comptroller under the new management. In the reorganization Shelby A. Falor, four years a member of the board of control, resigned and has become president of the Universal Drug Co., of Akron. W. D. Shilts, formerly a member of the board, has become assistant secretary of the company and H. B. Hamlin and W. D. Oburn, other members of the board, remain with the company.

Frank R. Griffin has been appointed assistant to the manager of the advertising department, in the division of domestic advertising, of The Goodyear Tire & Rubber Co.

Edward G. Wilmer, president of The Goodyear Tire & Rubber Co., has leased the A. H. Marks homestead in Akron and will live there for the summer with his New York business associates.

R. E. Wollcott, assistant credit manager, and Charles H. Waterman, purchasing agent, of The Miller Rubber Co., have resigned.

C. E. Wagner, export manager of The Miller Rubber Co., attended the International Trade Conference at Mexico City, beginning June 20, in the interests of his firm. He was also a delegate of the export managers' group of the Cleveland Chamber of Commerce, and of the Akron Chamber of Commerce.

James W. O'Meara, of the advertising department of The B. F. Goodrich Rubber Co., has resigned, effective July 1, and has not announced his future plans. For the past six years Mr. O'Meara had charge of the company's news service for newspapers and magazines.

J. H. Appleby, for many years connected with the St. Louis and Kansas City, Missouri, branches of the Firestone Tire & Rubber Co., has been promoted to the firm's force of special motorcycle tire representatives.

John D. Hess, Jr., has been promoted to manager of pneumatic tire sales for the Firestone Tire & Rubber Co, with headquarters at Akron. Starting with the company nine years ago as salesman at Detroit, Michigan, he has successfully filled the position of branch manager at Cleveland, Ohio, special representative to truck manufacturers, district manager on the Pacific Coast, and assistant to the western sales manager. He has been afforded an opportunity to study tire merchandising under all local conditions throughout the country and has gained a wide acquaintance in the tire and allied industries among whom his promotion is welcomed as well merited.

JOHN D. HESS, JR.

On account of ill health, O. L. Weaver, who was connected with The Star Rubber Co., Akron, Ohio, since its organization, has tendered his resignation. The office of sales manager, formerly held by Mr. Weaver, will be assumed by A. G. Partridge, who is also vice-president of the company. Mr. Partridge was previously vice-president and general sales manager of the Firestone Tire & Rubber Co., Akron, Ohio.

Dr. W. C. Geer, of The B. F. Goodrich Co., with Mrs. Geer, has left for Europe where they will travel for the next month.

Councilman Gus F. Kasch has proposed that monuments to the originators of four world industries in Akron be erected in Akron. Among them is a monument for Dr. B. F. Goodrich, the originator of the rubber industry on its present basis. The others are for the originator of the Chautauqua plan, cereals and the founder of the sewer pipe industry. Thus far Mr. Kasch's plan has not gone beyond suggestion.

Harry Quine, for several years connected with the lecture department of The Goodyear Tire & Rubber Co., has resigned to accept a position with the National Highway Council in Washington, D. C.

P. B. Martins, for more than 5 years manager of the safety department of the Firestone Tire & Rubber Co., has resigned.

The past presidents of the Chamber of Commerce, many of whom are directly or indirectly connected with the rubber industry, entertained the Italian Commission on electrification of Italian industries and railways at the City Club the latter part of May. The commissioners visited the Ohio Insulator Co. at Barberton, part of the Akron district, and The B. F. Goodrich Co. during the day before coming to the chamber dinner. They asked that Akron men assist Italy in building up its industries by the extension of credit and by actually going to Italy to give assistance.

Leroy R. Reifsnider is president, E. C. Shaw, formerly vice-president of The B. F. Goodrich Co., is vice-president, and Paul Held is treasurer of a new $2,000,000 building and loan association which has been organized and will open for business within a month. It is believed by the organizers that more money will be available for home building with the decrease in returns for rubber stocks.

Walter T. Akers has been named receiver for the B. & W. Rubber Co., one of the smaller and newer rubber companies of Akron. Louis W. Bogner, factory superintendent, filed the petition for receivership, alleging that the company owed him $2,019, which, under the administration previous to the receivership, had been lost. He also charged that the plant had been operated only a few months and was closed about September 1, 1920.

Little definite progress has been made in solving the difficulties of the Interlocking Cord Tire Co., Akron. The plan whereby the creditors were to be paid off within a year with money to be made by the company operating the plant was not accepted by the court under which the receiver was appointed. The receiver has asked that the stockholders pay the portion of their stocks which remained due, and the court ordered that the final payments on the stocks be made. Whether the stockholders will finally be able to obtain sufficient money to operate the plant and raise the receivership is a matter of doubt in Akron.

The employes of The Goodyear Tire & Rubber Co. gave a farewell party to their former chief, F. A. Seiberling, at the Goodyear Auditorium which he built for them, and it was one of the most touching scenes ever enacted in Akron. His brother Charles was presented with a loving cup, while a similar fund raised by the employes for Mr. Seiberling will doubtless be used to purchase additional equipment for the Children's Hospital.

MISCELLANEOUS OHIO NOTES

The Hercules Rubber Corporation reports a change of address from 908 Union Central Building to 922 Race street, Cincinnati, Ohio.

Dexter C. Hathaway, branch manager at Cleveland, Ohio, has been appointed to the assistant sales managership of The McGraw Tire & Rubber Co., East Palestine, Ohio. Temporarily he will continue to supervise the affairs of the Cleveland branch to which he has devoted himself since his affiliation with the company almost a year ago.

THE RUBBER TRADE IN THE MID-WEST

By Our Regular Correspondent

MID-WEST RUBBER MANUFACTURERS' ASSOCIATION

At the June 14th meeting of the Mid-West Rubber Manufacturers' Association, a stirring short talk was given by Ensign Roger V. Flory, of Chicago, attorney for the American Legion, in which he said, "The American Legion is taking the place of the G. A. R. in keeping alive and continuing the proper observances in patriotic matters," and urged that ex-service men be given preferential employment as a matter of patriotic duty.

The board of directors' meeting was presided over by George B. Dryden, who gave a very interesting review of the mechanical goods industry and expressed his opinion that the bottom price may not yet have been reached but nevertheless it is not a bad time to buy rubber. He believes that factories now given up entirely to the manufacture of tires and tubes should give more attention to other lines of manufactured rubber goods, as the possibilities of rubber manufacture have nowhere near reached the limit.

The following speakers were called upon and responded briefly: J. H. McGrory, Katzenbach & Bullock; O. L. Heath of The Barrett Company; C. H. Taveniere, Fred Stern & Co.; C. Stitt, A. Daigger & Co.; W. E. Wrisberg, Newsom Valve Co.; D. L. Spraker, Kokomo Rubber Co., and E. H. Bohlman, Cupples Company.

Sydney J. Roy, Hannibal Rubber Co., Hannibal, Missouri, gave a splendid talk on tires. He insisted that tires must be well made; they have been sold too cheaply, but an honest product must be turned out; the tire industry must be put on a solid foundation and fictitious adjustments eliminated. Mr. Roy pre-

dicted the greatest business the world has ever known after industry had passed through the present depression. Following Mr. Roy's talk, Thomas Follen discussed the question of foreign exchange.

The principal speaker of the day, Edward S. Babcox, Editor of the *India Rubber Review*, was detained at home and his address was read by the Secretary. It dealt with the plan of Herbert Hoover, Secretary of Commerce, to inaugurate a system of basic Federal-collected statistics that would constitute a great stabilizing influence if put into operation.

The meeting unanimously adopted the following resolutions:

Be it *Resolved*, by the Mid-West Rubber Manufacturers' Association, at the regular monthly meeting luncheon, Chicago Athletic Association, June 14, 1921, that the plan of Herbert Hoover, Secretary of Commerce for basic, Federal-collected statistics is hereby endorsed, and that the Mid-West Rubber Manufacturers' Association urge upon congressmen that they vote for the appropriation of $600,000 requested by Mr. Hoover to carry on this work.

Be it *Resolved*, by the Mid-West Rubber Manufacturers' Association, at the regular monthly meeting luncheon, Chicago Athletic Association, June 14, 1921, that all members of Congress be sent a bulletin of this Association carrying a resolution endorsing the plan of Herbert Hoover, Secretary of Commerce, for Federal-collected statistics.

MISCELLANEOUS MID-WESTERN NOTES

The Essenkay Products Co. has leased three buildings at 2601-9 Cottage Grove avenue, Chicago, Illinois, and plans to spend $15,000 in alterations. The present city sales and service department, now at Michigan avenue, will also be moved to the new quarters. F. D. Mayer is president of the company.

The Bennett Elastic Web Co., Chicago, Illinois, which was incorporated under the laws of Illinois, February 9, 1920, capitalized at $50,000, on December 20, 1920, increased its capital stock to $75,000. The incorporators of this company, which manufactures elastic web products and textiles, are all residents of Chicago and are: C. F. Bennett, W. B. Bennett, Benson Landon, Robert N. Holt, and Benson Landon, Jr.

H. O. Smith, who recently assumed control of the Racine Auto Tire Co., Racine, Wisconsin, is a veteran in the rubber industry. He was one of the organizers of the Indianapolis Rubber Co., and the G. & J. Tire Co., both of Indianapolis, Indiana. While president of these two companies, which later were merged with the Rubber Goods Manufacturing Co., Mr. Smith became identified with the Premier Motor Manufacturing Co. and served as its president. As one of the employer members of the National War Labor Board, Mr. Smith also played his part during the war.

The Standard Underground Cable Co., Westinghouse Building, Pittsburgh, Pennsylvania, has purchased approximately thirteen acres in the northwestern industrial section of St. Louis, bounded by Kingshighway Boulevard and Slevin, Geraldine, and Brown avenues, where it is proposed to erect, in the near future, a thoroughly up-to-date plant for the manufacture of insulated wire and cables. The buildings, several separate and complete units of brick concrete and steel, will comprise a weatherproof wire and cable factory, a copper-wire drawing mill, a magnet wire department, etc. The floor area will cover about four acres. Joseph W. Marsh is president of the company.

The Wishnick-Tumpeer Chemical Co., Chicago, Illinois, will place three automobiles at the disposal of members of the Mid-West Rubber Manufacturers' Association during the Pageant of Progress Exposition to be held on the Municipal Pier in Chicago from July 30 to August 14. Members of the company will act as guides and chauffeurs. Appointments may be arranged by mail.

Charles Piez, president of the Link-Belt Co., Chicago, Illinois, and former director-general of the United States Shipping Board Emergency Fleet Corporation, addressed the Engineering Advertisers' Association of Chicago at the Great Northern Hotel on June 7, his subject being "Advertising and Selling from the Executive Viewpoint."

Harry E. Geib has been appointed manager of the Chicago, Illinois, office of A. Schrader's Sons, Inc., Brooklyn, New York. Mr. Geib has been with the Schrader forces over five years and his exceptional executive ability has won him rapid advancement. He is particularly well-equipped to render to customers that efficient service characteristic of the Schrader house.

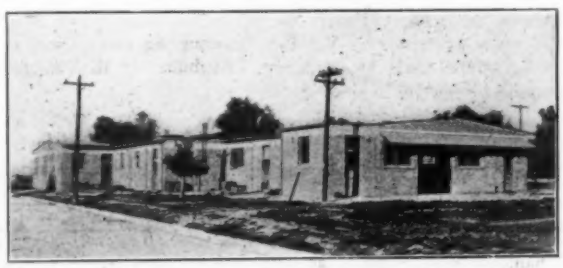
The Furness Corporation, 343 South Dearborn street, Chicago, Illinois, has at Clarksboro, Mercer County, Pennsylvania, what engineers claim to be the largest deposit of high-grade fuller's earth yet discovered in this country. Tests show it to equal any of the bleaching clays imported from England and heretofore held as standard. The company has begun the development of its holdings, which consist of 270 acres, a mill with a daily capacity of 60 tons having been established. Excellent shipping facilities and low cost of mining enable the product to be put into the Chicago market at a very reasonable price.

The stockholders of the International India Rubber Corporation, South Bend, Indiana, at their annual meeting held in January, voted that the name of the company be changed to Odell Rubber Co. The principal product of the company is "Odell" cord tires.

Building operations have commenced on the new $1,000,000 tire plant of the Wildman Rubber Co., at Bay City, Michigan. The site is on a tract of 63 acres just south of Salzburg. The building under construction is of reenforced concrete, 365 by 161 feet, three stories and basement, and will have a daily capacity of 2,500 tires and 5,000 Wildman self-sealing inner tubes. It is hoped to begin production before the end of the year.

THE MOST WESTERN TOY BALLOON FACTORY

One of the new and flourishing rubber industries on the Pacific Coast is the making of air and gas toy balloons and other inflatable novelties by the Pacific Balloon Co. at its plant, 186 Blaine street, Riverside, California. The concern was started a year and a half ago by H. A. Dodge, the president, who is also interested in a similar concern, the Howe-Baumann Rubber Co., of Newark, New Jersey, to supply the trade between Chicago and the West Coast.



PACIFIC BALLOON CO.'S PLANT, RIVERSIDE, CALIFORNIA.

Donald Fullerton is secretary-treasurer and manager of the new project that is producing 20,000 balloons daily and steadily increasing to meet a demand which the company has done much to promote. Until the advent of the company, toy rubber balloons were comparatively rare and dear on the Pacific Coast, it is said.

The factory was built especially for the manufacture of these toys, and it has an up-to-date equipment of dipping and curing apparatus, cement-mixing machines, form stripping devices, roller conveyors, etc. The rubber used for the gas balloons is cleaned,

milled and compounded at the Howe rubber works in New Brunswick, New Jersey. The factory is particularly well-ventilated and well-lighted. Riverside was selected because of its particularly non-humid climate as compared with other southern cities near the Coast. The rubber on the molds dries well and quickly in the warm, dry air; and only once, one day last summer, when the temperature was 112 degrees F., did the workmen have any trouble with the dippings, and then a large amount of finished stock stuck together and was ruined.

THE RUBBER TRADE ON THE PACIFIC COAST

By Our Regular Correspondent

MID-YEAR conditions in the rubber trade generally on the Pacific Coast are very encouraging, according to many representative manufacturers and dealers. Tires are going well, due not only to very favorable climatic conditions, an improved tone in all commercial circles, an increasing influx of tourists bringing their own cars, highway improvement on a continually broadening scale, and last, but not least, more aggressive salesmanship.

Mid-western and eastern tire makers are paying more attention than ever to the coastal territory and are establishing new agencies or strengthening old ones at strategic points near the Pacific and in the big hinterland.

Much relief was felt by the dealers in mechanical rubber goods at the recent settlement of the prolonged trouble in the building trades in San Francisco, where the strikers accepted without reserve a wage cut averaging 7½ per cent. Not only will this mean much directly to rubber men in the Bay City, but indirectly, it is figured, the effect will be very salutary in other big industrial centers on the Coast, which are invariably affected by the strong union labor movements of San Francisco.

Rubber footwear is going strong, wholesale dealers say, and their main anxiety is to get supplies. Their season runs to September 1. Rubber clothing has been in good demand in the northern district, and bathing goods have been selling particularly well in the southern section. Druggists' sundries find a steady sale; various extension plans of hydro-electric and public utility companies have revived dealings noticeably in insulated wire; and trade in reclaimed rubber shows a steady trend with slightly better prices.

SAN FRANCISCO NOTES

Hirsch-Blum Co., 1135 Van Ness avenue, San Francisco, has been appointed northern California distributer of Kenyon cord tires and tubes.

James D. Horan, manager of the Los Angeles branch, was a recent guest of the Pioneer Rubber Mills management in San Francisco. The Pioneer mills, which are in Pittsburg, California, continue to be one of the busiest rubber concerns on the Coast and overtime is the rule rather than the exception in several departments. A particularly good demand is reported for mechanicals, due to much activity in building lines in various Pacific states.

Joseph Tansey, of the Tansey-Crowe Co., 1233 Van Ness avenue, San Francisco, vulcanizer and distributer of Pennsylvania vacuum cup tires, has recently been attending a conference of dealers at the factory at Jeannette, Pennsylvania.

Automobile registration for the state of California for February, March, April and May, 1921, shows a total of 540,339 passenger cars, 30,757 trucks, 2,456 trailers, and 14,427 motorcycles. Figures for the same months in 1920 were 421,982, 29,326, 1,099, and 16,243. This state, like many other sections of the country, therefore had a loss in motorcycles, but had a big gain in other vehicles. Superintendent of the State Motor Vehicle Department, Charles J. Chenu, estimates that California will have 675,000 motor vehicles registered by the end of the year.

LOS ANGELES AND VICINITY

"Buy a spare" is the slogan which the allied California automobile trades associations intend to use to influence the sale of possibly 300,000 more tires in the State. According to a recent checking up of cities in the southern part of the State, less than 46 per cent of the automobiles carry a spare tire and even a smaller percentage have fitments for carrying a "spare."

As there are nearly 600,000 motor cars in California, the tire dealers reckon on about 300,000 possible purchasers of "spares." Should but one-third the amount be purchased, it is remarked that this would be a gain to the rubber trade worth working for and worthy of the emulation of tire makers and dealers throughout the other forty-seven states.

Some concerns handling rubber and rubberized goods are doing extra well. Weinstock & Nichols, Los Angeles agents for the Gould storage battery which utilizes not only hard rubber cells but also rubber-armored (impregnated) wooden separators, report last April business four and a half times that of a year ago and May's total nearly as large as April.

The Maxon Tire Co., Los Angeles County agent for Thermoid tires, is extending its operations, having leased another store at Tenth and South Main streets, Los Angeles.

A. E. Bush has been appointed manager of the Tire Company of California, specializing on Kelly-Springfield tires, at 1201 South Hill street, Los Angeles.

The Keaton Tire & Rubber Co., 1337 South Flower street, Los Angeles, is distributing to dealers a book and chart on rim equipment that is unique and useful.

A. F. Osterloh, vice-president and general manager of the Goodyear Tire & Rubber Company of California, is chairman of the manufacturing committee of the Chamber of Commerce of Los Angeles, which committee, comprising eighteen representative business men of the city, is making elaborate preparations for a Buyers' Week to be held from August 8 to 13, inclusive. The Union Terminal Co. has offered the use of 200,000 square feet of floor space free in its new building on East Seventh street. The committee hopes to have nearly $100,000 available for advertising and for entertaining possible buyers of rubber and many other Los Angeles products.

G. S. Richardson has been licensed in Santa Ana, California, to use the name and method of the Process Rubber Co., 5918 Hollywood Boulevard, Los Angeles, in infusing new life into tires and tubes, a process described at length in THE INDIA RUBBER WORLD, June 1, 1921.

The Elaterite Varnish & Rubber Co., 55th and Alameda streets, Los Angeles, was chartered July 7, 1919, with capital stock consisting of 2,500,000 shares of stock at $1 par value. Donald H. MacDonald is secretary.

The big brick factory of the United States Compression Inner Tube Co., at Burbank, California, is being hurried to completion, and operations, the directors believe, will be started early in the autumn. The company intends to use this plant to supply the Pacific Coast trade, as its Tulsa, Oklahoma, factory serves the Mid-West, and its Kittanning, Pennsylvania, factory supplies the company's puncture-proof inner tubes and casings to Eastern buyers.

Tire dealers on the Coast remarked a perceptible increase in sales following the recent cut in the price of gasoline from 27 to 25 cents.

W. V. Goar has been appointed to succeed H. C. Edelman, resigned, as manager in charge of sales at the Los Angeles branch of the Pennsylvania Rubber Co., Jeannette, Pennsylvania, with headquarters at 950 South Main street, Los Angeles. He formerly represented the Pennsylvania company in Seattle.

NORTHWESTERN NOTES

Arrangements are being made to resume work at the plant of The Washington Tire & Rubber Co. in Spokane, Washington, which concern has been inactive for several months. It is said that some financial difficulties that troubled the concern have been practically cleared up, and while operations may not be on as large a scale as formerly, it is expected that they will be proportionately more profitable. John B. White, for one year president of the concern, has resigned, and J. L. Bowling, vice-president, takes his place. J. W. Brett has been elected vice-president. H. S. Burdick is still secretary-treasurer. Roy Hayes, of Waverly, Washington, has been chosen as a trustee to take Mr. White's place on the board.

The Sound Rubber Co., Tacoma, Washington, mention of which was made in a recent issue, was incorporated April 19, 1916, under the laws of the State of Washington. Its authorized capitalization is $5,000,000 common and $1,500,000 preferred stock. The officers are: A. J. Ritchie, president and general manager; Morton Gregory, vice-president, and A. E. Braden, secretary-treasurer. The directors include the above and J. L. Carman, E. M. Hayden, S. J. Claridge and Marvin Evans. The company has been manufacturing tires since last September. Its factory is 80 by 260 feet, of solid concrete, and contains approximately 40,000 square feet of floor space. The site comprises about four acres of land, providing room for two additional units of the same size.

The Blekre Tire & Rubber Co., St. Paul, Minnesota, has established Pacific Coast headquarters by appointing as its agent Larry Sullivan, of the Fashion Garage, Tenth and Taylor streets, Portland, Oregon. He will cover six counties in that state and Clarke County, Washington.

The Spreckels "Savage" Tire Co., of San Diego, has opened a warehouse branch in Portland, Oregon. It is located close to "auto row." G. T. Cummings is corporation salesman and Delbert T. Fett handles the dealers. Pacific Coast manager Lester, driving from San Diego, attended the opening of the new depot on Puget Sound for Savage "Aristocrat" cords and fabrics.

SOUTHWESTERN NOTES

The United States Rubber Co. has taken a long lease on a large building at Fifth avenue and West Adams street, Phoenix, Arizona. George W. Miller, the new manager, reports that business is improving despite the reaction in the cotton industry and the long-continued dullness in mining.

A transaction which excited much interest recently was the transfer of the Southwest Cotton Co.'s 15,280 acres of planted land in the Salt River Valley, Arizona, and the company's gins and oil mills at Phoenix, Mesa, Temple, Glendale, Tolleson, Gilbert, Peoria, and Sarival to the Valley Ranch Co., a new corporation headed by Guy P. Nevitt, attorney for the Southwest company. A controlling interest is to be held by the Southwest company, with a remainder available for sale, the old company accepting the new company's notes for $710,000.

The transfer means the liquidation of The Goodyear Tire & Rubber Co.'s interests in cotton properties in Arizona, the Southwest company having represented Goodyear. The value of the property affected is put at $3,250,000, about $2,000,000 being the land value. It is understood that many other crops will be planted as well as cotton. The land is chiefly at Litchfield, a new and model town, twenty miles west of Phoenix in the lower Agua Fria valley.

Another large cotton ranch belonging to the Southwest company at Goodyear, thirty miles southeast of Phoenix, it is said, will be plotted for farmers in order to still further lighten the load of the Goodyear company.

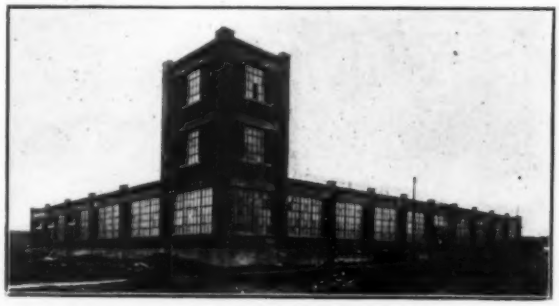
It will not be the fault of ranchers in Perris Valley, Riverside County, California, if rubber manufacturers and others find next season's supply of cotton scanty, for they are disregarding the rule adopted by cotton-growers throughout the Southwest to reduce acreage in view of the big slump in prices, and they are, instead, extending their acreage, so that over 2,000 acres will be planted to cotton this year. Long-staple Durango is favored. One-quarter of the 2,500-acre ranch owned by Secretary of Commerce Herbert C. Hoover, at Wasco, is to be planted to cotton each year. Pima Egyptian is favored by the cabinet officer.

CANADIAN NOTES

JOSEPH STOKES RUBBER CO., LIMITED, BEGINS OPERATIONS

THE JOSEPH STOKES RUBBER CO., LIMITED, has completed its plant at Welland, Ontario, Canada. Representing an investment of $250,000, the plant is the first and only building to be designed, constructed and equipped for the manufacture of hard rubber products in Canada. It is situated on eight acres of land laid out with the future expansion of the plant in mind. The building, constructed of brick, steel and timber, and known as the slow-burning type, is 160 feet long and 60 feet wide with a wing 60 feet wide and 60 feet long, the latter including a vulcanizing room and toilets.

There is, in addition to the factory shown, a boiler room 60 by 60 feet, with a coal pocket and tracks overhead that



PLANT OF THE JOSEPH STOKES RUBBER CO., LIMITED, WELLAND, ONTARIO, CANADA

connect with a siding of the Grand Trunk & Wabash Railroad. The building is triangular in shape with a tower, three stories high, forming the apex, which will be used for transformers and storage tank.

Since the completion of the buildings, machinery has been installed with the result that the company now has a thoroughly modern plant of which it may well be proud.

While the Joseph Stokes Rubber Co., Limited, is the outgrowth of the Joseph Stokes Rubber Co., Trenton, New Jersey, and has the same officers, its affairs are entirely separate and the concern is operating under a charter granted by the Dominion Government. The plant is at the present time running only at a low capacity, but after additional machinery is installed, several hundred skilled workmen will be given employment.

The Goodyear Tire & Rubber Co. of Canada, Limited, with main office at Toronto, Ontario, has materially improved its condition recently and increased production by 300 tires daily. The company is being reorganized but with practically no changes in the personnel. It is free from bonds, mortgages, and liens, and has no past-due current accounts. It has materially reduced its bank borrowings and maintained full credit with its banks, while it is consistently taking advantage of all discounts. C. H. Carlisle is treasurer and general manager.

REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—H. C. Pearson's "Crude Rubber and Compounding Ingredients."

The Rubber Trade in Great Britain

By Our Regular Correspondent

THE time-worn adage about the necessity of first catching your hare before commencing to cook it seems to have a certain application to such journalists as essay to write about the rubber trade. You have got to find the trade before you begin, and the matter is by no means so simple as it used to be in past days. True, the labor troubles on the score of wages have been temporarily settled, but the coal strike with its benumbing effect upon trade generally is still with us, being now in its eighth week.

It is to be feared that the restricted railway service will have some effect upon the attendance of country visitors to the Rubber Exhibition; another possible malevolent factor is the ill-temper prevalent among the rubber-share-holding public at the new low-level price of 9*d.* per pound for the raw commodity coupled with the now customary notification of the passing of dividends, or at the best, the reduction in their amount. It certainly cannot be said that the recent speeches of chairmen of rubber companies have done anything to dispel the existing gloom, though I quite agree that it would be wrong to use optimistic language unless the facts and portents justified it.

TWO THOUSAND NEW USES OF RUBBER

It appears that the award of the adjudicators in the competition promoted by the Rubber Growers' Association with regard to new and extended uses of rubber will not be known in time for the Rubber Exhibition. Not only have the suggestions amounted to somewhere about 2,000, but it has been considered advisable to prove the statement made in many promising cases. This naturally takes time, hence the delay in making the award, and though it is unfortunate as regards the Exhibition, it is obvious that to come to an erroneous conclusion through haste would be more unfortunate still. The Exhibition seems likely to suffer, compared with previous ones, by the abstention of many firms which would doubtless have exhibited in more prosperous times. It is no secret that there is a general tightness of money, as appears also to be the case in America, to say nothing of Poland, and the natural tendency is to incur no unnecessary expenditure. It is now quite common for firms which used to pay their accounts by check to give three months' bills where the cash is much required. Another feature of the current year is the disinclination of rubber firms to renew contracts for chemicals, the prevalent idea being that prices have by no means reached bottom.

EXAMPLES OF DEPRESSION

As typical examples of the depressed condition of affairs, I may note here that, mainly owing to the coal strike, the large Silvertown works closed on April 22, and the directors have stated that under the circumstances they cannot recommend an interim dividend on the ordinary shares; last year it was 2½ per cent, and on the other side of the industry the Malacca Rubber Plantation Co.'s report for 1920 shows a profit of only £18,580 against £182,732 in 1919 and £230,749 in 1916. Instead of the 30 per cent paid last year, even the 7½ per cent cumulative preference dividend has to be passed this year.

THE PEACHEY PROCESS DEMONSTRATION PLANT

Matters have now progressed to an important stage in that a demonstration plant and laboratory have been erected at 380 High Road, Willesden, London, N. W. The plant has been erected by David Bridge Co., Limited, Castleton, Manchester, on the lines of an experimental plant first put up at their own works. With the mixing and calendering arrangements there is no novelty to call for notice, and the method of carrying out the cold vulcanization with the two gases, sulphur dioxide and hydrogen sulphide, is the novelty which arrests attention. This process is the same in principle as that previously shown on the laboratory table except that methods for dealing with the waste gases are necessarily added. The hydrogen sulphide or sulphuretted hydrogen, is made by the ordinary process of acting upon sulphide of iron with sulphuric acid and is stored in a gasometer outside the building, while the sulphur dioxide is purchased in the liquid form in cylinders.

The two units of the vulcanizing plant follow the lines of the steam pan and the dry heat stove. In the case of the pan, the goods to be cured are placed in the pan on a wooden rack. On the pan being closed the air is exhausted and sulphur dioxide admitted for ten minutes. This gas is then blown out and after a further exhaustion the hydrogen sulphide is admitted and allowed to act for thirty minutes. No inconvenience, it is understood, arises from the water produced in the interaction of the gases.

The continuous vulcanizing apparatus on the lines of the dry-heat stove is intended for the cure of fabrics, floor coverings, soling material, etc., containing leather buffings, wood meal, and so on. The chambers are constructed of wood with rollers at top and bottom. The first contains the sulphur dioxide gas, and the second, which is three times as long, the hydrogen sulphide. The materials enter the chambers under tension and between elastic flaps in order to avoid leakage of gases, this being naturally an important matter. It is stated that there is an absorber for the waste gases outside the building; probably there are two absorbers if the lines of ordinary chemical works practice are followed, and subsequent use is to be made of the different sulphur compounds obtained.

Up to now the chemist in the rubber works has been a consultant and an analyst. There is now an opportunity, where the Peachey process is adopted, for him to prove his worth as a process engineer. At any rate, it seems obvious that the process cannot be controlled by the ordinary foreman-vulcanizer of the past, and today, as much will depend upon chemical control of the operations. Doubtless the present year will see many pilgrimages of rubber folk to Willesden to see the plant in operation.

CHESS & STEAD, LIMITED

This company, having got into financial difficulties owing to bad trade and depreciation of stock, decided at a recent meeting of creditors to accept an offer of 6*s.*8*d.* in the pound sterling. The firm is an amalgamation of Stead-Hunt and Chess-Brand with works at Brimscombe, Gloucestershire, and Middleton, Lancashire. T. H. Roberts, formerly the chief proprietor of Wood-Milne, Limited, is a director and the Middleton works were started under his auspices to make reclaimed rubber. The claims made for this product seem to have left the rubber manufacturers cold and the business was later turned over to rubber soles and heels, etc. Owing to the occurrence of a fire at the Brimscombe works and the destruction of the papers and books, the exact position of affairs cannot be ascertained. No doubt the concern will pull around after the slump in conjunction with others who have found themselves in a tight corner.

NORTH KENT RUBBER CO.

The affairs of the North Kent Rubber Co. of London have been considered by a meeting of creditors. This is another instance of a one-man affair started with a small capital in pre-war days and developed into a prosperous concern under war

conditions, subsequently, however, getting into difficulties with the coming of the slump in trade. The proprietor, Charles Russell, has obtained the assistance of friends who will pay a sum equal to about 5*s.* in the pound sterling. The estate will be dealt with under a deed of assignment, a committee of inspection having been appointed. It is noteworthy that the largest creditors are Chess & Stead, Limited, for £2,196.

FINANCIAL RESULTS

The fortieth annual general meeting of Siemens Bros. & Co., Limited, showed that the results for 1920 were quite satisfactory, as has been the case with the other cable-making concerns, the general business slump having left them unaffected. The net profit was £253,254, against £211,209 for 1919, and the dividend remains at 10 per cent free of tax. With regard to the proposed increase of capital and bonus distribution the chairman said that the whole of the authorized ordinary share capital of £1,500,000 was issued and fully paid up, and any addition was to be avoided if new capital could be issued on another basis and it was proposed to issue one million 10 per cent cumulative preference shares. It was further stated that to put the old shareholders on something like an equal footing with the new ones they would receive a bonus distribution of one new preference share for every five ordinary shares held. With regard to submarine cable, the principal feature of the Woolwich works, it was stated that the output in 1920 exceeded that of 1919 and in this, as in the other branches of the business, such as electrical apparatus, the business in hand was such as to enable a prophecy of a 10 per cent dividend for the current year.

Johnson & Phillips, Limited, another firm of electric cable manufacturers, has declared a dividend of 12½ per cent, the same as for 1919, the profit being £98,405 against £90,000 for the previous year.

The report of Bell's United Asbestos Co., Limited, a combination of Bell's Asbestos Co. and the United Asbestos Co., shows a net profit of £64,670 and enables 12½ per cent to be paid on the ordinary shares in addition to the preference dividend. The addition to the works at Harefield, Middlesex, for making the new Hurcan building slabs has recently come into operation, but owing to the high costs of labor and materials, the report does not speak too optimistically of the immediate future. The only important competitor of the company in this country is Turner Brothers Asbestos Co., Limited, which, in addition to its Rockdale premises, has large works in Trafford Park, Manchester, for the manufacture of building slabs and similar material.

THE EARL OF SHREWSBURY AND TALBOT

The Earl of Shrewsbury and Talbot, who died recently, was known in the rubber trade not so much by reason of being the premier Earl in the British peerage, but on account of his connection with the Shrewsbury & Challiner Tyre Co., of Ardwick, Manchester, now a subsidiary company under the control of Chas. Macintosh & Co., Limited. The fitting of hansom cabs in London and Paris with solid rubber tires was due to his initiative and he was prominent in the foundation of the company mentioned above, though he cannot be considered a rubber man in the sense that Lords Colwyn and Grinerton are.

SELENIUM OXYCHLORIDE

The importance of this body as a new solvent appears to have been amply demonstrated by Dr. Victor Lenher, professor of chemistry at the University of Wisconsin. It appears to dissolve bodies like enamel, bakelite, hard resins, etc., which have proved resistant to all the known solvents. Further than this, the press notice refers to it as a good solvent for rubber. One rubber firm informed me that they understood that the new solvent would entirely replace solvent naphtha. There are plenty of solvents for rubber, but comparatively few of them are likely to be used on a large scale in the industry for some reason or other, such as prices, toxicity, mineral content, etc. Although I am not in a position to speak authoritatively in the matter, I imagine that though selenium oxychloride may prove to be useful in the rubber trade, it will not be in the way of replacing solvent naphtha.

CAPTAIN BUCKLETON HONORED

The following modest item appears in a Liverpool (England) paper:

The King of the Belgians has bestowed upon Captain Ernest Edward Buckleton, of 8, Croxteth Road, Liverpool, the Palmes en Argent de l'Ordre de la Couronne, in recognition of services rendered to the Belgian cause during the war.

This honor, to be made a Knight of the Belgian Empire, is well deserved. It will be recalled that this well-known Anglo-American rubber man, in the early days of the Great War, opened his home to some 75 destitute Belgians and through his efforts among friends here and in Europe, cared for hundreds more. Belgium has not forgotten, nor should we, who appreciate such broad-minded, self-sacrificing helpfulness.

CAPTAIN E. E. BUCKLETON

FIFTH INTERNATIONAL RUBBER EXHIBITION

The Fifth International Rubber Exhibition was opened at Agricultural Hall, Islington, London, June 3, at noon, by Sir Owen Philipps, G. C. M. G., M. P., the president, supported by most of the prominent members of the rubber industry.

The exhibition is thoroughly representative of all sections of the rubber industry, from the tree to the completed article. All the rubber-producing countries are represented and some new ideas with regard to new uses of rubber are in evidence.

The conferences promise to be of unusual importance and interesting papers will be read. A large number of competitions for valuable trophies have been announced. There will be frequent displays of moving pictures of scenes in rubber-producing and other tropical districts and instructive demonstrations in the factories.

A detailed report of the exhibition, which closes June 17, will appear in THE INDIA RUBBER WORLD, August 1, 1921.

THE RUBBER TRADE OF FRANCE IN 1920

IMPORTS

RECENT official statistics for the trade of France during 1920 show that on the whole imports decreased. This holds good for the rubber industry too, in almost every department of which the figures for 1920 imports are lower than during 1919; in some cases considerably so. Thus, imports of crude rubber were 272,350 quintals (220.46 pounds), value 215,701,000 francs ($14,875,931), in 1920, as against 307,347 quintals, value 243,419,000 francs ($33,344,921), in 1919. The figures for 1913 were 174,410 quintals, value 122,783,000 francs ($23,697,119).

Manufactures of rubber totaled 96,348 quintals, value 249,097,000 francs ($17,192,897), in 1920; 138,444 quintals, value 362,999,000 francs ($49,725,890), in 1919, and 33,260 quintals, value 44,386,000 francs ($8,566,498), in 1913. In manufactures, the most notable decreases were in rubber thread: 2,371 quintals, value 8,536,000

francs, in 1920, against 4,513 quintals, value 16,247,000 francs, the year before; rubberized clothing: only 776 quintals, value 5,044,000 francs, in 1920, as compared with 3,508 quintals, value 22,802,000 francs, in 1919; rubber footwear: 4,725 quintals, value 8,505,000 francs, in 1920, and 6,120 quintals, value 11,016,000 francs, in 1919; tires, tubes, covers: 49,153 quintals, value 132,713,000 francs, and 80,553 quintals, value 217,493,000 francs, in 1920 and 1919, respectively.

EXPORTS

Exports of crude rubber and gutta percha amounted to 106,994 quintals, value 84,739,000 francs ($5,844,069), in 1920; 103,150 quintals, value 81,695,000 francs ($11,191,096), in 1919 and 166,870 quintals, value 75,537,000 francs ($14,578,641), in 1913.

The totals for manufactured goods during the same years were: 187,849 quintals, value 462,309,000 francs ($31,883,380); 111,597 quintals, value 273,941,000 francs ($37,525,890); and 69,300 quintals, value 100,288,000 francs ($19,355,584). There was a noteworthy increase in the exports of footwear which jumped from 1,148 quintals, value 1,952,000 francs, in 1919 to 15,479 quintals, value 26,314,000 francs. Figures for rubber clothing nearly doubled in 1920, being 5,018 quintals, value 29,004,000 francs, against 2,559 quintals, value 14,790,000 francs, the year before. Exports of tires, tubes, covers, increased from 85,138 quintals, value 217,101,000 francs in 1919, to 138,645 quintals, value 353,545,000 francs the following year.

TRADE DISTRIBUTION

The share of different countries in this trade during 1920 was as follows: Great Britain exported crude rubber valued at 126,435,000 francs ($8,719,655), manufactures to a value of 160,873,000 francs ($11,094,690); United States came next with manufactures totaling 59,422,000 francs, ($4,098,069); Belgium sent crude rubber to a value of 2,175,000 francs ($150,000) and manufactured rubber valued at 10,535,000 francs ($726,552). In exchange France sent to Great Britain manufactures amounting to 82,147,000 francs ($5,665,310) and crude rubber for 21,931,000 francs ($1,512,483); United States took crude rubber worth 19,337,000 francs ($1,333,586); exports to Germany were 19,251,000 francs ($1,327,655) worth of manufactures and crude rubber valued at 13,886,000 francs ($957,655); to Switzerland went manufactures amounting to 33,151,000 francs ($2,286,276) and to Belgium, manufactures and crude rubber valued at 58,236,000 francs ($4,016,276) and 7,042,000 francs ($485,655) respectively. As will be noted trade with Germany is beginning to assume sizable proportions.

According to statistics issued by the Ministry of Labor, based on the inspection of factories situated in different regions of France, there were in pre-war days 524 rubber and paper factories employing 41,909 workers, male and female. In August, 1914, this number had decreased to 287 factories employing only 19,107 hands; however, in October, 1920, it was found that there were 504 factories employing 47,365 persons.

THE RUBBER TRADE IN EUROPE

By Our Regular Correspondent

FRANCE

THE Société Industrielle des Téléphones not only manufactures electrical articles, but also rubberized fabrics, pneumatic tires, electric apparatus, etc. Before the war, profits were between 2,600,000 francs and 2,800,000 francs. During the last years, however, the figures showed considerable fluctuations. In 1914 net profits rose from 1,792,000 francs to 5,103,000 francs in 1916 and 8,831,000 francs in 1917. In 1918, they dropped to 6,670,000 francs, then to 5,000,000 in 1919 and to 4,120,000 francs in 1920. During the same time the dividends rose from 15 francs per share to 30 and then 40 francs.

For the last two years the dividends were 35 francs. In general, the company has not exactly spent money freely and at last the directors have decided to renew the equipment in use since the foundation of the firm in 1893. For this purpose, the capital is to be increased from 18 to 36 million francs.

The Etablissements Industriels E. C. et A. Grammont has placed on the market 32,000 "B" shares. Up to the present only 28,000 "A" shares have been negotiated. This company has a capital of 30,000,000 francs, and factories at Lyon, in the Isère and in the Var, where it manufactures wires and cables for telegraph and telephone, submarine cables, and all kinds of electrical goods and apparatus. It has wire-drawing establishments and also produces rubber goods, particularly tires, tubes, belting, etc.

The company has progressed during the last few years. Before the war business amounting to 20,000,000 was reported, but in the latest report, that of 1919-1920, transactions amounted to over 100,000,000 francs, and this in spite of the increased costs of labor, materials and coal. The gross profits were 17,478,000 francs and the net proceeds were 2,055,000 francs. The dividend was fixed at 50 francs per share. The reserves exceed 78,000,000 against liabilities of 47,000,000.

The Société Repneu of 1 bis, rue Trayon, Paris, is in voluntary liquidation.

The Société Française du Caoutchouc d'Oullins has been formed at Lyon with a capital of 3,000,000 francs. The firm will engage in the manufacture and sale of rubber goods and similar products.

It is learned that the Société de Pontoux et Cie. has been changed into the Société Le Caoutchouc Industrial, with a capital of 800,000 francs and offices at Rue Saint-Régis (Belle-de-Mai), Marseilles.

GERMANY

A correspondent relates, in the *Gummi-Zeitung*, his experience concerning the rubber goods trade in the occupied parts of Germany. He states that foreign salesmen are taking the place of Germans. It seems that they are mostly Belgians, some French, but very few English or Americans, who offer local merchants all kinds of rubber goods at prices below those quoted by German manufacturers in unoccupied Germany. The terms of the foreigners are severe, but in spite of this they succeed in capturing the orders. Patriotism is not proof against lower prices, and on both sides of the Rhine there is a demand for foreign goods. The most important German firms stock quantities of French, Belgian, English and American rubber goods. In Frankfort-on-the-Main, goods are advertised or offered for sale under French names; thus, sticking plasters have become "emplâtre caoutchoutée," nipples, "tétines," etc.

Of course, the presence of foreign troops necessitates the carrying of foreign goods and the using of foreign terms. Nevertheless, the correspondent is much exercised over what he has found and sees in everything a sign of the Allies' determination to ruin Germany's trade and even to win over to themselves the occupied territories.

Rubber goods may now be exported freely from Germany without the export permits that were formerly required. It is said that this measure is a direct result of the "Sanctions" of the Entente which created a very difficult economic situation here.

A new rubber article has appeared in the shape of suspenders made entirely of red rubber with the exception of the strap-loops. At first they were made from auto-tire waste, but the pieces thus obtained were not always long or wide enough, and now producers of these suspenders buy sheets of smooth red rubber about 0.7-meter (one meter equals about 39 inches), wide and 2 millimeters thick, from which strips of the necessary size are cut. It seems that the new suspender is meeting with a good demand and can compete with the usual kind of suspender as far as price is concerned.

Richard Werner, of Werner & Pfleiderer, Cannstatt-Stuttgart, received from the political science faculty of the University Tübingen the degree of Doctor of Political Science.

On April 23, Moritz Wolf, one of the founders and owners of the firm of Bernhard, Wolf & Co., died at Frankfort-on-the-Main at the age of 69 years. The deceased was well-known and popular in the rubber industry and had traveled considerably outside of Germany. He was on the board of the Zentral-Verbandes des Chirurgischen Gummiwarenhandels Deutschlands E. V., the central association for the surgical rubber goods trade of Germany.

The founder of the Mitteldeutsche Gummiwarenfabrik, formerly Louis Peter, died recently at Frankfort-on-theMain, at the advanced age of 81 years. In 1872 he founded this company and devoted himself to it with such energy that it steadily grew in importance and extent. In 1905 he changed the concern to a stock company. His ceaseless striving in behalf of the rubber industry was rewarded with the title "Kommerzienrat" (Commercial Advisor).

COMPANY REPORTS

The Mitteldeutsche Gummiwarenfabrik, formerly Louis Peter, has decided to increase its capital stock to 30,000,000 marks. The increased capital is made necessary by new heavy expenditures. It is also considered advisable to make use of the present conditions in the capital market which are still favorable.

The annual report of the Asbestund Gummiwerke Alfred Calmon, Akt.-Ges., Hamburg, shows net profits for the year 1920 of 1,713,529.89 marks. A dividend of 15 per cent was declared. It was proposed to double the capital and bring it to a total of 20,000,000 marks. This increase is called for by expansion of the business and plans to reopen two asbestos departments and to take up again the manufacture of gymnastic and sporting shoes with rubber soles. This company began its activities in 1886 as a private company for the manufacture of asbestos and rubber goods. In 1896 it was incorporated, the capital being 1,500,000 marks. It is thus exactly 25 years since the company took on its present form and on the occasion of this anniversary, it was proposed to set aside the sum of 1,000,000 marks for the benefit of employes who had distinguished themselves by long and faithful service.

The Hackethal- Draht- und Kabelwerke, A.-G., Hanover, reports net profits of 4,878,578 marks for the year 1920. A dividend of 20 per cent was declared.

Aktiengesellschaft Metzeler & Co. has decided to raise its capital by 4,000,000 marks, by issuing 4,000 six per cent preferential shares. The capital of the company now consists of 8,000,000 original, and 4,000,000 preferential shares.

The Leipziger Gummiwarenfabrik, Aktiengesellschaft, formerly Julius Marx Heine & Co., reports that, on the whole, 1920 was satisfactory. Net profits were 327,976 33 marks and a dividend of 15 per cent was declared.

The Hannoversche Gummiwerke Excelsior, A-G., Hanover Limmer, experienced a huge demand for its goods in 1920. However, owing to the coal situation, all demands could not be fulfilled. The net profits for the year amounted to 4,356,582.95 marks. A dividend of 30 per cent plus five per cent bonus was declared to shareholders, and 1,356,582 marks were reserved for employes.

NEW FIRMS

Vulkan Gummiwaren-Handelsgesellschaft m. b. H., Hattingen; manufacture and sale of all kinds of rubber goods.

Fritz Willnow Gummi- und Asbestfabrikate, Charlottenburg.

Elastic, Süddeutsche Gummi-Industrie und Auto-bedarf-Handelsgesellschaft m. b. H.; manufacture and sale of all kinds of rubber goods, sale of automobiles, bicycles and accessories.

Offenbacher Gummiwerke Karl Stoeckicht Aktiengesellschaft, Offenbach (Main). This concern will continue the business known as Offenbacher Gummiwerke Karl Stoeckicht in Offenbach-on-Main and will manufacture and sell all kinds of rubber goods. The capital is 8,000,000 marks.

Gummikon, G. m. b. H., Klosterstrasse 70, Berlin C. 2; manufacture and sale of all kinds of rubber goods.

Norddeutsche Sportball-Fabrikation, G. m. b. H., Berlin; manufacture of sport balls and other sporting goods.

Calorifix, Dr. Freund & Co., Dresden; manufacture of rubber and asbestos goods, also technical goods.

P. Sauset, Kommanditgesellschaft in Nürnberg, 7 Wohlgemutstrasse, Nürnberg; manufacture of belting. Main offices are in Bonn.

Maschinenfabrik Atlanticwerk, G. m. b. H., Niederwalluf; manufacture and sale of all kinds of technical goods.

Gummigesellschaft Futura G. m. b. H., Hanover; manufacture and sale of "Futura" rubber heels and soles.

FINLAND'S FOREIGN TRADE

Official statistics for 1920 show that despite the unfavorable times trade in rubber was fairly satisfactory. Among the imports were crude rubber, gutta percha, balata: 233,183 kilos, value 4,443,000 finmarks (finmark=$0.193 [normal]); belting: 159,855 kilos, value 10,322,000 finmarks; automobile tires and bicycle pedals: 350,628 kilos, value 19,956,000 finmarks; rubber shoes: 294,191 kilos, value 14,323,000 finmarks; other rubber goods 18,109 kilos, value 1,123,000 finmarks.

FOREIGN TARIFFS

SPAIN

In the recent revision of the Spanish Customs Tariff, which went into effect May 21, 1921, certain articles are mentioned which are of interest to the rubber industry. It should be noted that duties on many articles were, last November, considerably increased. By the new law certain other classes have been reduced to the level of 100 per cent over the tariff of 1912. This new list includes tire covers and inner tubes of rubber, waterproof clothing of rubber; toys and games.

The duties imposed last November have been increased so that solid rubber tires with metallic mounting are now 100 per cent higher than the tariff of 1912.

Articles	New Rate, Pesetas Per Kilo	Old Minimum Rate, Pesetas Per Kilo
Rubber hose, pipes, sheets, etc.	5.20	1.30
Rubber belting, packing, etc.	8.00	2.00
Solid rubber tires with metallic mounting	4.80	1.20
Pneumatic tires	10.80	2.70
Rubber elastics	10.80	2.70
Rubber waterproof fabrics	14.80	3.60
Rubber clothing	19.60	5.60

GERMANY

A recent proclamation, as stated in the *Deutsche Reichsanzeiger* of May 4, requires that certain goods, whether of foreign or German origin, must be provided with, on importation from the occupied German territory into unoccupied Germany, an entry permit. Among the list of goods requiring this entry permit the following are noted: india rubber tubes for tires of vehicles and cycles; covers for the same of textile goods impregnated or coated with rubber; box and cord packing of textile goods in combination with rubber; asbestos paper and board; asbestos thread, cord and twine; asbetos tissues (except rubberized asbestos tissues); other unspecified wares of asbestos, or rubberized asbestos tissues.

LATVIA

In Latvia export restrictions on certain articles have been considerably relaxed, and a special license from the Ministry of Trade and Industry is now no longer necessary where goods are to be

exported. Rubber goods are among the various articles mentioned which are exempt.

MEXICO

A customs office has been established at Guadalajara, Mexico, in connection with the parcel post division of the post office. Parcels forwarded to Guadalajara by express or freight will, as heretofore, be subject to clearance at other ports of entry.

A Presidential decree, dated March 28, and quoted in the *Diario Oficial* (Mexico) of April 23, has the following modification of import duties among its items:

Articles	Rate of Duty: Pesos Per Kilo	Rate of Duty: Cents, Gross
Rubber tires for passenger motor cars	1	50
Rubber tires for motor vehicles for carrying goods	0	75

THE RUBBER TRADE IN THE FAR EAST

By Our Regular Correspondent

CEYLON

COMPARATIVE statistics to hand would show that rubber restriction in Ceylon has been anything but a success. In spite of the fact that a large percentage of London and Ceylon-controlled estates voted in favor of the 25 per cent restriction which was to take effect from November 1, 1920, exports of rubber from this colony since January 1, 1921, are considerably higher than they were during the same period of 1920.

Thus the total exports of rubber from Ceylon to all countries from January 1 to April 11, 1921, amounted to 25,966,223 pounds, against 22,235,004 pounds during the corresponding period of 1920. That is to say that in 14 weeks Ceylon exported 3,731,219 pounds of rubber more than during the same period of the year before. At this rate, the total exports for 1921 would exceed those for 1920 by over 10,500,000 pounds.

It is realized that increases have been partly due to the clearance of part of the heavy stocks at Colombo. However, the stocks still on hand indicate that there must be other reason for the heavy exports.

Some time ago, there was a feeling here among many authorities that the Government should enforce restriction by 50 per cent on the lines suggested by Malaya. Now, however, since the Colonial Secretary has definitely refused to enforce restriction in Malaya, nothing will come of such a plan anywhere. It seems, therefore, that there will not be much of any kind of restriction here or elsewhere.

At a recent meeting of the Kelani Valley Planters' Association, a motion was made that the parent association be asked to urge the abolition of the rubber export tax. While it is recognized that the present condition in the rubber industry makes the tax a very heavy burden, the removal of which would aid planters considerably, it is realized that the financial stress of the Ceylon Government is a serious obstacle in the way of the abolition of the tax. However, the local press is not in favor of retention of the tax for, as the *Weekly Times of Ceylon* puts it, "the Ceylon rubber industry is at present too much of a broken reed for the Government to lean upon it with much advantage in its condition of financial exhaustion."

Trade between Ceylon and Germany is steadily reviving. Direct shipments this year have been large and it is believed that considerable quantities of Ceylon goods have gone to Germany through Holland. Up to the middle of April the amount of rubber exported direct to Germany was 1,339,959 pounds or nearly 600 tons.

Freight rates from Ceylon to the United Kingdom, for general cargo, including rubber, have been reduced to 65*s.* per 50 cubic feet. This reduction represents a fall of 35*s.* in the case of rubber.

MALAYA

It is now known that the Secretary of State for the Colonies, Winston Churchill, has definitely refused to legislate for compulsory restriction. In a telegram to the High Commissioner of the Federated Malay States he says: "There is no assurance that producers in other countries would be submitted to similar restriction so that they may benefit at the expense of producers in Malaya perhaps permanently. Conditions must be allowed to right themselves."

This has caused great disappointment among advocates of restriction, though it cannot be said that local producers were wholly unprepared for the decision. In fact, for at least a month it was openly said that the scheme would probably not go through and the question of what should be done has been widely discussed in the papers here. Correspondence reveals that people are awakening to the fact that there is a need for unity among planters; a definite policy regarding the planting of new areas, regulation of output, fixing of remunerative prices, knowledge regarding rubber stocks and world requirements.

As the knowledge has grown that the Government would and could do very little in the situation, the feeling that the industry must take care of itself has become stronger. There are still voices in favor of some form of government assistance—financial, for instance. On the whole, however, it seems that the majority are in favor of some scheme of self-help. The *Straits Times* has devoted several lengthy articles to the spreading and strengthening of this idea and has supported its views by quoting the examples of the recent action taken by the Copper Export Association in America and the methods of the California fruit growers.

In the rubber supplement of May 6 of its weekly issue, *The Straits Budget*, the *Straits Times* gives some points in a scheme of self-help. The idea is to ask the Government to grant to a body regularly constituted, and fully representative of the rubber industry, the exclusive right of exporting rubber from the ports. Armed with this right, the industry could introduce an effective system of control over output, varying the degree of restriction from time to time as conditions required. This Rubber Control Board would see to it that reliable records were obtained regarding supply, demand and price. It would maintain experimental and research work on behalf of the industry generally; ascertain annually the "full capacity output" of all estates and determine what percentage could be profitably put on the market, and issue export certificates for the authorized output of each estate.

One thing has been fully realized by most people, that unless some kind of restriction or control of rubber output is resorted to, it will take years—some say at least five—before the situation will be appreciably improved.

Some interesting statements made by the well-known Teluk Anson, planter, Maurice Maude who recently revisited Malaya, may be quoted. He is in favor of restriction and recommends alternate day tapping. He is one of those that believe that the cost of production could and should be reduced. In his opinion, 1*s.* 6*d.* a pound for rubber would be a very good business proposition for all first-class companies. Finally, he condemns the waste of time and money in the manufacture of so-called fancy rubber like pale crêpe, smoked sheet, etc. The aim should be, not to try to please the broker's eye, but to produce blocks of rubber that will require less time and expense in making.

COMPARISON OF RUBBER IN BURMA AND MALAYA

In a report on rubber in Burma, H. C. Pinching, A. R. C. S., mycologist and senior scientific officer of the Rubber Growers' Association in Malaya, states that the average growth of the trees, age for age, in Lower Burma, is inferior to the average growth of trees in Malaya or Sumatra, but superior to that of trees in

Ceylon. This inferiority of the growth of trees in Burma to that of the Malayan trees, decreases toward the South. In many places in the Mergui and Tenasserine districts the average growth of the trees was only slightly, if at all inferior to that of Malaya. The difference in the rate of growth in Burma is attributed to the climatic conditions there, which are less favorable than in Malaya. In Malaya the rainfalls are more or less evenly distributed throughout the year but in Burma there is a wet and a dry season and in the North less than 10 per cent of the annual rainfall occurs during the five dry months, leaving 90 per cent to fall during the period June to November.

Mr. Pinching found that planters in Burma took great interest in the agricultural side of rubber producing, in contrast with Malayan planters who have not given this side of the matter the attention it deserves.

Burma estates were found to be well-kept, every care being expended in keeping trees in a healthy condition. Owing to the care taken to keep the land free from jungle timber and jungle stumps, very few trees were found to be affected with root diseases like those caused by *Fomes lignosus, Ustulina zonata,* etc. In this matter of clean clearing Burma estates are far ahead of Malayan estates, where considerable trouble has been caused by root diseases, groups of over 100 trees having been killed off by *Fomes lignosus.*

The principal diseases met with in Lower Burma were those due to different species of *Phytophthora,* as: black stripe canker, abnormal leaf-fall, pod disease, patch canker, pink disease, die-back, *Ustulina zonata* (not affecting the roots, however), and a few cases of brown bast were also observed.

The average yields in Lower Burma are lower than the yields from Malayan estates, which is partly due to the fact that from six weeks to two months of tapping is lost during the Southwest monsoon every year. A fair average estimated yield from Burma trees according to age is:

Age years	Pounds per acre	
4— 5	50	(October to December only)
5— 6	150	
6— 7	180	(October to December only)
7— 8	230	(October to December only)
8— 9	300	(October to December only)
9—10	350	
10—11	400	

Factories and general establishments of Burma estates were up-to-date and well-cared for. Labor is plentiful, rice cheap and abundant, so that estates suffered no loss on this head.

According to Mr. Pinching, Lower Burma should be as successful a rubber-growing country as Malaya. Although present-day yields do not equal those of Malaya, he believes that they can in time approximate if not equal those yields.

The conditions for tenure of rubber lands are easier in Burma than in Malaya and these with the better labor conditions in Burma should put that country in a very favorable position as a rubber producer. Unfortunately the rate of exchange and the cost of freights on rubber have been detrimental to the rubber planting industry during the last few years. But, naturally, these are matters beyond the control of the rubber industry.

RUBBER ROAD EXPERIMENT

The first experimental portion of rubber road was recently laid down in Singapore. It consists of a small sample, three yards by twelve, and is located at the approach to a weighbridge, over which heavy granite-laden larries leave the yard, and a record of the traffic which these will carry over the rubber will be available in due course of time.

THE NETHERLANDS EAST INDIES

The effects of the present depression in the rubber industry are being felt more and more, particularly in Sumatra where costs are a good deal higher than in Java. It is reported that the number of discharged European planters' assistants in Sumatra's east coast already amount to over 60. Some have received free passage to Europe plus four months' salary, while the majority were not provided with free passage and received only the usual six weeks' salary. Most of these are still in Sumatra, while some have gone to Java and to the Straits to try their luck there. Complaint has been made that whereas the Government in the British rubber producing colonies is helping European unemployed, the local government is taking no action at all.

Where assistants have not been discharged salaries have been decreased. Three companies—the Anglo-Dutch Estates Agency, Limited, Harrisons & Crosfield, and the Marihat Sumatra Plantagen Cie., are known to have reduced salaries to pre-war levels plus 100 gilders to meet the present high cost of living.

Reports have it that the firms on the west coast of Sumatra in Tapanoeli have decided to decrease salaries temporarily by one-third.

Coolie wages are also being cut and hundreds of coolies have been discharged and repatriated to Java.

Up to the present nothing definite has been done here regarding restrictions of output, but it is said that Sumatra planters are beginning to think seriously of restriction and not only of 25 per cent, but 50 per cent.

In Java a note of optimism persists. Of course, it is realized that the crisis is practically only just beginning and that it may last a considerable time.

Rubber experts advise producers to keep calm and rightly consider that the controlling of panicky feelings and actions is the only way to help in getting out of the present dismal situation. Proper attention to lands is urged and it is advised to plant some harmless growth on lands that have to be temporarily abandoned.

The consoling factors here are the efficient experiment stations and the cost of production. Regarding the first it is interesting to quote what Dr. A. W. Nanninga of Deventer has to say. He was sent by the Minister of Agriculture, Industry and Commerce on a study tour to Malaya, Java and Sumatra. In his report to the Minister on his return, recently, he said that while both the experiment stations and the plantations of Sumatra and Java are hard at work trying to solve the many problems connected with the planting and preparation of rubber, very little is done in these respects in Malaya, and, he concluded—the Malayan rubber industry may result as did the cinchona industry. This industry is flourishing in Java but could not develop in India where the land was just as suitable for cinchona as in the first-named country.

As to costs of production, at present Java and Ceylon produce at a lower cost than other rubber-producing centers and the two islands together produce only about 100,000 tons of rubber. Consequently both Java and Ceylon can sell at some profit so long as they can manage to keep costs under selling prices, and a good many estates in these places can do that even at prevailing rates.

JAVA NOTES

From March 10, the freight rate for rubber was reduced to 27.50 gilders per cubic meter or 82.50 gilders per 1,800 kilos.

It is reported that Mr. and Mrs. Alberto Pirelli are in Java inspecting the rubber plantations belonging to the Pirelli firm. On their way, the couple stayed in Malaya for a few days to inspect the Johore estates. It seems that the Italian Pirelli company has increased its capital to 100 million lire and intends to form a dollar company in Singapore to supply the factories with raw materials and also to facilitate the organizing of the sale of their tires, cables and other goods in the Far East.

The Second Netherlands East Indian Industrial Fair is to be held at Bandoeng, Java, from September 19 to October 9, 1921. According to reports by the committee, the great support given by the local government, public institutions, industrials, and merchants, promises that this fair will be a great success.

Recent Patents Relating to Rubber

THE UNITED STATES

GRANTED MAY 3, 1921

NO. 1,376,404 Demountable rim for tires. A. L. Cole, Auburndale, Mass.
1,376,750 Hose-supporter. C. W. Egerton and J. W. Hanf—both of Brookivn, N. Y.
1,376,778 Tennis ball having hollow rubber center with a fabric cover applied directly to the rubber and having depressions molded in surface. W. J. Orr, Chicopee, Mass., assignor to A. G. Spalding & Bros., Jersey City, N. J.
1,376,783 Sanitary protecter. C. Schoen, Scranton, Pa.
1,376,868 Tire-valve for truck tires. L. O. Gibson, Rawlins, Wyo.
1,376,965 Rubber heel. F. Nerger, Chicago, Ill.
1,376,968 Multiple tire valve. J. A. Overlander, New York, N. Y.
1,376,970 Pad for attaching valves to tires. A. T. Pickens, St. Louis, Mo.
1,377,011 Elastic tire. K. Fukuda, Tokio, Japan.
1,377,031 Hose-supporter. R. M. Silva, Brooklyn, N. Y.
1,377,079 Demountable rim for tires. W. F. Laing, Cumberland, Md.
1,377,098 Tire-boot. M. C. Seymour, Hesperia, Mich.
1,377,162 Disk wheel for pneumatic tires. G. H. Forsyth, Chicago, Ill.

REISSUES

15,099 Tire-wrapping machine folder. W. C. Stevens, Akron, Ohio, assignor to Pierce Wrapping Machine Co., Chicago, Ill. (Original patent No. 1,196,044, dated August 29, 1916. Divided; original patent No. 1,243,357, dated October 16, 1917.)

GRANTED MAY 10, 1921

1,377,170 Emergency tire. W. F. Aichele, Good Ground, N. Y.
1,377,173 Demountable tire rim. L. D. Allen, assignor of two-fifths to W. E. Allen—both of San Francisco, Calif.
1,377,260 Truss having pad and belt lining of sponge rubber. J. N. McCay, Watts, Calif.
1,377,283 Tire tread. F. G. Schmuit, Baltimore, Md.
1,377,353 Cushion wheel. W. B. Kerrick, Los Angeles, Calif.
1,377,354 Cushion wheel. W. B. Kerrick, Los Angeles, Calif.
1,377,375 Combination pneumatic tire casing. J. Velcio, assignor of one-third to C. A. Harpman—both of Youngstown, O.
1,377,466 Inflatable display form. R. H. Cowley, Salt Lake City, Utah.
1,377,596 Combined tire valve and pressure indicator. J. Many, New York, N. Y.
1,377,614 Corset with elastic inserts. V. Buchanan, New York, N. Y.
1,377,627 Vehicle tire. C. S. Preston, San Diego, Calif.
1,377,642 Rotary rubber heel. A. Twarogowski and S. Klosinski—both of Detroit, Mich.
1,377,683 Bed pad with water-proof casing. W. M. Henes, Amherst O.
1,377,771 Demountable rim for tires. J. B. Harris, Cleveland, O.
1,377,782 Pneumatic tire. T. Mori, New York, N. Y.
1,377,903 Garter. R. A. Manny and J. A. Rielly—both of Brooklyn, N. Y.
1,377,910 Detachable rainproof top for baby carriages. W. R. Munson, Sharon, Pa.
1,377,924 Observation kite-balloon. E. Prassone and L. Avorio—both of Rome, Italy.

GRANTED MAY 17, 1921

1,378,025 Wheel with rim having centrally disposed tire cushion made up of segments of rubber cushion supported on metal plates. E. E. Hans, Kalamazoo, Mich.
1,378,081 Sleeve protector. B. Yaeger, Columbia Heights, Minn.
1,378,148 Tread for tires. G. W. Taylor, Everett, Mass.
1,378,234 Airplane shock absorber. J. T. Hughes, Council Bluffs, Ia.
1,378,243 Window cleaner. L. S. Kracke, Chicago, Ill.
1,378,273 Life-saving apparatus. G. Picco, New York, N. Y.
1,378,313 Tire construction. W. F. Beasley, Plymouth, N. C.
1,378,315 Tire core. W. A. Black, Rocky Ford, Colo.
1,378,331 Automobile tire. W. J. Davis and J. Hammell—both of Tipton, Ind.
1,378,332 Disk wheel for pneumatic tires. E. R. Draver, Richmond, Ind. (Original application divided.)
1,378,397 Demountable collapsible tire rim. F. G. Beron, assignor to F. P. Guilfoyle—both of Waterbury, Conn.
1,378,550 Nail holding and spacing strip of rubber to apply to soles. E. J. Miller, York, Pa.
1,378,641 Device for producing life-like motion of inanimate objects. J. E. Williamson, Norfolk, Va.
1,378,683 Teat-cup for milking machines. B. A. Nowles, Azalia, Mich.
1,378,747 Elastic casing for watch with less preventing device. A. White, Williamstown, N. J.
1,378,763 Split demountable rim for tires. J. T. Cadenhead, Ensley, Ala.
1,378,764 Split demountable rim for tires. J. T. Cadenhead, Ensley, Ala.
1,378,766 Blow-out boot for pneumatic tires. A. Chapman, assignor to The Eagle Claw Tire Boot Co.—both of Kellogg, Idaho.

GRANTED MAY 24, 1921

1,378,832 Cushion tire. H. C. Babel, Buffalo, N. Y.
1,378,870 Knee-pad with elastic straps. E. N. Kauffman, Mahaffey, Pa.
1,378,905 Container for pneumatic inner tubes. W. Schuldt, Arlington Township, Woodbury County, Iowa.
1,378,922 Intermittent vacuum massage machine. G. A. Ward, Chicago, Ill.
1,378,968 Demountable rim for tires. F. K. Mallison, assignor by mesne assignments to Firestone Steel Products Co—both of Akron, Ohio.
1,379,032 Vehicle wheel with demountable rim for tires. J. C. Mantennach, Lakewood, assignor to The Standard Parts Co., Cleveland—both in Ohio.
1,379,043 Tire. T. J. Reed, Kansas City, Mo.
1,379,096 Pneumatic tire pump. J. C. Gilbert, Grafton, Mass.
1,379,101 Abdominal supporter. J. L. Holt, Portland, Ore.
1,379,216 Pneumatic tire. C. Sattler, Brooklyn, N. Y.
1,379,220 Pressure gage for pneumatic tires or the like. M. C. Schweinert, West Hoboken, and H. F. Kraft, Ridgewood—both in New Jersey.
1,379,289 Urinary apparatus. E. C. Rogers, St. Louis, Mo.
1,379,314 Inner liner for tires. A. L. Sewell, assignor of one-third to E. J. Moran and one-third to J. A. Greeley—all of Chicago, Ill.
1,379,321 Pneumatic vehicle spring. L. I. Thompson, Portland, Ore.
1,379,458 Detachable rubber pads for protection soles. T. R. Lulham, Johannesburg, South Africa.

THE DOMINION OF CANADA

GRANTED MAY 3, 1921

211,163 Dust cap for tire valves. E. Van A. Myers, East Orange, New Jersey, U. S. A.
211,164 Dust cap for tire valves. E. Van A. Myers, East Orange, New Jersey, U. S. A.
211,242 Rubber mat. Gutta Percha & Rubber, Limited, assignee of J. H. S. Kerr—both of Toronto, Ont.
211,266 Waterproof tire cover, with elastic warp threads at selvages. The Russell Manufacturing Co., assignee of W. Achtmeyer—both of Middletown, Conn., U. S. A.
211,267 Pressure gage for tires. A. Schrader's Son, Inc., assignee of M. C. Schweinert—both of New York, New York, U. S. A.

GRANTED MAY 10, 1921

211,330 Repair patch for pneumatic tires. J. R. Buechler, Des Moines, Ia., U. S. A.
211,331 Inner tube. O. T. Bugg, Poughkeepsie, New York, U. S. A.
211,360 Blow-out patch for pneumatic tires. C. Horine, Lima, Ohio, U. S. A.
211,378 Pneumatic-tire filler. C. H. Lambert, Hartwell, Ohio, U. S. A.
211,389 Tire with sectional sponge-rubber filler. T. J. McCaffery, Seattle, Wash., U. S. A.
211,408 Resilient tire. A. Van der Stichelen, Ghent, Belgium.
211,431 Reinforcement for cushion tires. The Goodyear Tire & Rubber Co., assignee of J. E. Hale and E. F. Brunner, coinventors—all of Akron, Ohio, U. S. A.
211,434 Windshield cleaner. The Jubilee Manufacturing Co., assignee of A. F. Gillet—both of Omaha, Neb., U. S. A.
211,469 Inner tube. A. B. Shaw, Medford, and E. E. Fay, assignee of half-interest, Brockline—both in Mass., U. S. A.

GRANTED MAY 17, 1921

211,542 Hose supporter. B. C. Harriss, New Rochelle, New York, U. S. A.

GRANTED MAY 24, 1921

211,736 Pneumatic tire. J. Cairnes, South Norwood, London, Eng.
211,740 Garment supporter. T. L. Caudle, Wadesboro, North Carolina, U. S. A.
211,768 Shoe fasteners to replace lacing. F. Ferris, Westwood, Calif., U. S. A.
211,806 Dust cap for pneumatic-tire valves. J. W. Laird, Pasadena, Calif., U. S. A.
211,884 Cap for tire valves. H. A. Wood, Kingston, Ont.
211,915 Range-finding instrument for use in balloon observation. The Goodyear Tire & Rubber Co., assignee of R. H. Upson—both of Akron, Ohio.

THE UNITED KINGDOM

PUBLISHED MAY 4, 1921

159,416 Pressure gage for tires. K. F. Lees, 139 Pendleton street, New Haven, Conn., U. S. A.
159,447 Golf-ball gage. J. P. Cochrane and W. Patton, Murano Works, Albert street, Edinburgh.
159,491 Cushioned spring wheel. C. A. Mendenhall, Farmland, Ind., U. S. A. (Not yet accepted.)
159,590 Gramophone needle-carrier provided with rubber buffer. H. F. Honner, 32 Dunvegan Gardens, and A. Neachell, 201 Westmount Road—both in Eltham, London.
159,609 Microphone. H. J. Palmer, 151 Clive Road, and Telephone Manufacturing Co., Limited, 42a, Martell Road—both in West Dulwich, London.
159,611 Rubber heels reinforced by metal studs. C. J. Wattson, 8 Cliffs Road, St. Clair, near Dunedin.
159,639 Inhaler primarily intended for self-administration of anesthetics. L. B. Hall, 28 Station Road, Winchmore Hill, Middlesex.
159,641 Appliances for playing table football, etc. W. W. Milne, 4 Cessnock street, Glasgow.
159,760 Flexible rubber-sheathed double electric conductors, having the extra rubber sheathing capable of being dyed after vulcanization. British Insulated & Helsby Cables, Limited, and E. A. Bayles, The Oaks, Helsby, Cheshire.
159,768 Recessed rubber tire. E. R. Simms, Elks Building, Scottdale, Pa., U. S. A.
159,792 Flexible collars made of rubber fabric or compound reinforced along edges and at button-holes. T. Hase, 883 Sacramento street, San Francisco, Calif., U. S. A.
159,818 Spring wheel with continuous outer rigid ring and rubber ring, hub and cushions. F. Mathieu, Marseilles, France. (Not yet accepted.)
159,912 Detachable rubber pads for protecting soles. T. R. Lulham, Bellevue East, Johannesburg, South Africa.
159,915 Spring heel with continuous outer rigid ring and pneumatic hub and cushions. W. R. Borrie, Arlington House, Richmond Road, Stockton-on-Tees.
159,941 Tire casings manufactured from yarn or thread prepared from viscose, then rubber-coated. Dunlop Rubber Co., Limited, 1 Albany street, Regent's Park, London, and W. H. Paull, Para Mills, Aston Cross, Birmingham.

Chemical Patents will be found on pages 740-741. Machinery Patents on pages 748-749.

159,943 Milk churn provided with rings of rubber to lessen noise. E. Meldal, 49 Elm Park Mansions, Park Walk, Chelsea, London.
159,944 Parachute having resilient spreading-device attached. L. B. Jahn, Montevideo, Minn., U. S. A.
159,963 Device for administering anesthetics to animals. E. B. Reynolds, Royal Veterinary College, Great College street, Camden Town, London.

PUBLISHED MAY 11, 1921

160,043 Submarine cables insulated with one coating of india rubber, two coatings of vulcanized india rubber and a protecting coat of gutta percha. B. S. Hunt, 354 Acton Lane, Acton, London.
160,095 Exercising apparatus with elastic cords. R. D. Hughes, Old House, Waddon, Surrey.
160,108 Rubber heel lift having front corner tip portions inclined upward. F. J. Gleason, 20 Prescott street, Cambridge, Mass., U. S. A.
160,340 Spring wheel with solid tire. A. A. A. Darche, 39 Boulevard St. Martin, Paris, France.
160,343 Flat rubber cover to be sprung over mouth of a cup or jug, and having rubber teat projecting from one side. J. Abrahamson, 58 Mersey Road, Widnes, Lancashire.
160,356 Damper for moistening gummed surfaces, formed of rubber tube. H. B. Rogers and M. G. Rogers, 5 Prince's street, Hanover Square, London.
160,359 Flexible plug for repairing punctures in pneumatic tires. E. Jaume, 22 Boulevard Voltaires à Aubagne (Bouches-du-Rhône), France.
160,412 Collapsible rim for tires. M. C. O'Connor, 13 Victoria Road, Whalley Range, Manchester.

PUBLISHED MAY 19, 1921

160,476 Tire protector. W. Yarworth-Jones, 15 Carteret street, Westminster.
160,541 Rim for mounting pneumatic tires. R. T. Smith, 111 Lovely Lane, Warrington, Lancashire.
160,568 Golf ball with hollow core, formed of two parts vulcanized together and wound with elastic thread under tension. F. T. Roberts, 1105 Lakeview Road, Cleveland, Ohio, U. S. A.
160,696 Golf ball with resilient core having shell formed with abrasive portions interspersed with smooth ones on surface. R. H. Hazeltine, 49 West 45th street, New York., New York, U. S. A.
160,712 Stopper for hot-water bottle, etc. J. J. Purdie, Dunavon, Lansdowne Road, Sidcup, Kent, and Leyland & Birmingham Rubber Co., Limited, 24 Duke street, Aldgate, London.

PUBLISHED MAY 25, 1921

160,942 Sectional inner tube for pneumatic tires and mold for making. T. B. McLeroth, 32 Caversham Road, London.
160,984 Rubber-padded horseshoe. B. P. Gray, Ellangowan, Bishops Road, Sutton Coldfield, Warwickshire. (Addition to No. 113,988.)
161,047 Leather and canvas casing for pneumatic tires. Societe F. E. C. I. T. (Fabricazione Esportazione Copertoni Imperforabili-Torinoi), 1 via Accademia Albertina, Turin, Italy.
161,049 Vehicle wheel with non-supporting casing enclosing spokes, provided at inner and outer edges with strips of rubber. Dunlop Rim & Wheel Co., Limited, Alma street, and G. E. Sharp, 42 Kingsway Stoke—both in Coventry.
161,066 Motorcycle knee-grips. Wood-Milne, Limited, 2 Central Buildings, Westminster, and G. H. Pearson, 36 Highgage avenue, Fulwood, near Preston, Lancashire.
161,108 Pneumatic tire comprising central air tube surrounded by a concentric series of smaller tubes communicating, through non-return valves, with a ring carrying the main inflating-valve, the tread portion being reinforced by two over-lapping series of flexible metal bands enclosed by leather bands stitched together. R. Osgood, Calbourne, Thurlow Park, and W. G. Huxtable, Villa Belza—both in Torquay, Devon.
161,124 Swimming glove. M. Schreiner, 415 St. Ann's avenue, Bronx, New York, U. S. A.
161,144 Tire composed of series of rubber laminæ, each carried by perforated metal plate shaped to embrace a rim. B. Loutzkoy, 1 Viktoria-Luiseplatz, Berlin. (Not yet accepted.)
161,177 Device for warning of tire deflation. Michelin & Cie., Clermont-Ferrand, France. (Not yet accepted.)
161,290 Rubber tips for crutches, etc. M. S. Snyder, 605 First street, East Calgary, Alta, Can.

NEW ZEALAND

PUBLISHED APRIL 21, 1921

43,465 Sole-plate of leather slit for adjustment and having openings in which rubber or other pads are inserted. G. Lawler, Ngapuhi Road, Remuera, Auckland.
44,029 Pneumatic shoe-heel grip. G. Lawler, 123 Remuera Road, Remuera, Auckland.
45,137 Pneumatic tire sectional inner tube with partitions, etc. T. B. McLeroth, 32 Caversham Road, London, N. W. 5, Eng.

TRADE MARKS

THE UNITED STATES

SERIAL NUMBERS PUBLISHED MAY 3, 1921*

NO. 126,752 STAMINA OF THE SIOUX—inner tubes and fabric and cord tires. Sioux City Tire & Manufacturing Co., Sioux City, Ia.
126,787 MASCOT TUBES above representation of a ram's head above a panel bearing the quoted words, "Too Tough for Me"—inner tubes. American Wholesale Corporation, Baltimore and Cumberland, Md.
134,482 ANGELUS TIRE COVER superimposed above representation of a tire against a triangular background—fabric tire covers. Parker & Waterman Manufacturing Co., Los Angeles, Calif.
137,100 LONG LIFE within a double-outlined diamond—rubber and canvas hose—The Whitehead Bros. Rubber Co., Trenton, N. J.
140,236 RITA—bloomer-apron dress-protector. I. M. Weisert, New York, N. Y.
143,904 WALOHN—corset bones and stays. American Hard Rubber Co., New York, N. Y.

SERIAL NUMBERS PUBLISHED MAY 10, 1921*

126,827 TIGER-FOOT—tires. The Standard Tire Co., Willoughby, O.
131,611 TUSASAG on representation of an airplane within a circular band bearing the words United States and South America Corporation. Justice to All—bathing caps, raincoats, and leather, rubber, and fabric shoes for men, women and children. The United States & South America Corporation, New York, N. Y.
136,751 FAULTLESS on representation of label showing children playing with balloons. The Faultless Rubber Co., Ashland, O.
140,488 TORON—sulphur-terpene compounds and solutions. Clapp Products Co., Boston, Mass. (See THE INDIA RUBBER WORLD, October 1, 1920, page 26.)
140,503 AQUANON—waterproofing composition for fabrics of all kinds. W. B. Price, Poughkeepsie, N. Y.
141,017 N within a black circle—fabric fire-hose. Chas. Niedner's Sons Co., Malden, Mass.
142,956 BOB-BETTY BELONGINGS between two concentric circles, the inner one enclosing the letter B—animals, birds, chickens and dolls made of rubber, cloth, hand decorated or colored, and stuffed with cotton, and a stuffed rubber Santa Claus for Christmas-tree decoration. Bob-Betty Belongings, Carlsbad, California.
143,619 REVERE—tires. Revere Rubber Co., Providence, R. I.

SERIAL NUMBERS PUBLISHED MAY 17, 1921*

126,321 DEEP-O-DIVER—artificial minnows. James Heddon's Sons, Dowagiac, Mich. (See THE INDIA RUBBER WORLD, June 1, 1919, page 493.)
137,392 SEAMLESS—hot-water bags or bottles. The Seamless Rubber Co., Inc., New Haven, Conn.
140,346 PROGRESS above representation of a roller bearing the words All Season—rubber rollers for inking presses. Progress Roller Co., Omaha, Neb.
140,678 ARCH FORM—men's, women's and children's boots, shoes, and slippers of leather, rubber, etc. Thomas G. Plant Co., Boston, Mass.
140,900 PENNINGTON with shield bearing the letter P—boots and shoes of leather or leather and rubber in combination. Pennington-Crowell Shoe Co., Manchester, N. H.
141,006 "AESEL"—compounds for use in vulcanizing rubber. Michigan Chemical Co., Essexville, Mich.
142,611 WIRBESTOS—clutch facings and brake linings. Durwyllan Co., Paterson, N. J.
142,627 ALL IN ONE—heel cushions. L. G. & S. S. Co., Boston, Mass.
142,628 STEPSOFT—heel cushions. L. G. & S. S. Co., Boston, Mass.
142,631 FOOT SAVE—arch and heel cushions. L. G. & S. S. Co., Boston, Mass.
142,813 DANDY LINE and representation of a dandelion—pneumatic tires and inner tubes. Standard-Four Tire Co., Keokuk, Ia.
143,297 RACINE MULTI-MILE CORD—tires. Racine Rubber Co., Racine, Wis.
143,574 GOLDEN ROD and representation of a spray of golden rod—tires and tubes. Standard Four Tire Co., Keokuk, Ia.
145,202 "BELDENITE"—rubber-covered electrical conductors. Belden Manufacturing Co., Chicago, Ill.
145,209 SMOOTH POINT SAFETY FOUNTAIN PEN, NEW YORK, U. S. A., and representation of a safe—fountain pens. Samuel A. Harris, New York, N. Y.

SERIAL NUMBERS PUBLISHED MAY 24, 1921*

116,849 PPP conventionally arranged with two small triangles to occupy a diamond-shaped space—pneumatic tires. The Parker Tire & Rubber Co., Indianapolis, Ind.
119,784 WSM arranged as a monogram within a circle—rubber calenders, mills, vulcanizing presses, molds, cores, tubing machines, tire-applying presses, etc. The Wellman-Seaver-Morgan Co., Cleveland, O.
131,633 LOCHLY—raincoats, rubber shoes, boots, slippers, leggings, puttees, etc. Franklin Simon & Co., Inc., New York, N. Y.
133,808 31 REVERE on red disk surrounded by white circle—golf balls. United States Rubber Co., New Brunswick, N. J., and New York, N. Y.
134,394 SAVAGE beneath seal bearing profile of Indian's head—rubber and rubber composition tires. The Spreckels "Savage" Tire Co., San Diego, Calif.
135,609 ONAZOTE—expanded vulcanized rubber for tires, tubes, shock-absorbers, etc. C. L. Marshall, London, England.
139,342 AZO—zinc oxide and mixtures containing it, for use as pigments. American Zinc, Lead & Smelting Co., Boston, Mass.
140,004 RED WING—rubber belting. Webb Bros. Belting Co., Kansas City, Mo.
140,553 Seal or label bearing in white letters on black background the words R. T. VANDERBILT CO., N. Y., AMERICAN PRODUCTS, SUPER SULPHUR—chemical accelerator used in vulcanizing rubber. R. T. Vanderbilt Co., Inc., New York, N. Y
142,197 RAINBOW with representation of section of rainbow—chewing gum. M. S. Copeland, Oelwein, Ia.

TWO KINDS OF TRADE MARKS NOW BEING REGISTERED

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

GRANTED MAY 3, 1921
Under Act of February 20, 1905

141,824 STEADFAST—tire casings and tubes. The Achilles Tire & Rubber Co., Inc., Binghamton, N. Y.
141,946 HEAVY TOURIST—tires and tubes. The Goodyear Tire & Rubber Co., Akron, O.
142,020 SAMSON—bicycle tires. Mead Cycle Co., Chicago, Ill.

*Notice of opposition must be filed with the Commissioner of Patents, Washington, D. C., within thirty days after this date.

142,059 NASHCO—dress shields. S. K. Naschek, New York, N. Y.
142,065 SEMINOLE—tire tubing and casing. The National Sales Co., assignor to J. W. Sutherland—both of Chicago, Ill.
142,066 NASALCO—inner liners, tubes, boots, patches and flaps. The National Sales Co., Chicago, Ill.

Under Act of March 19, 1920, Section 1 (b)

142,206 HI-TEST—rubber and cotton duck hose, belting, packing, valves and tires. Hudson Mechanical Rubber Co., Trenton, N. J., and New York, N. Y.
142,207 HUDSON—rubber and cotton duck hose, belting, packing, valves and tires. Hudson Mechanical Rubber Co., Trenton, N. J., and New York, N. Y.
142,208 CLERMONT—rubber and cotton duck hose, belting, packing, valves and tires. Hudson Mechanical Rubber Co., Trenton, N. J., and New York, N. Y.
142,209 RIVET—rubber and cotton duck hose, belting, packing, valves and tires. Hudson Mechanical Rubber Co., Trenton, N. J., and New York, N. Y.

GRANTED MAY 10, 1921

Under Act of February 20, 1905

142,257 GEM—rubber erasers. Joseph Dixon Crucible Co., Jersey City, N. J.
142,262 FALLS—tires, tubes, casings, shoes and repair parts. The Falls Rubber Co., Cuyahoga Falls, O.
142,263 FAUST and representation of Faust—trousers-supporting belts. Faust Mfg. Co., Chicago, Ill.
142,284 THE BEST—KLEINERT—rubber aprons, infant's sanitary goods, bathing caps, bloomers, etc. I. B. Kleinert Rubber Co., New York, N. Y.
142,294 MCGRAW—tires and tubes. The McGraw Tire & Rubber Co., East Palestine, O.
142,297 MADISON TIRES—tires. Madison Tire & Rubber Co., Inc., Buffalo, N. Y.
142,307 CASTLE CORD—pneumatic-tire casings. New Castle Rubber Co., New Castle, Pa.
142,342 4810—rubber and fabric hose. United States Rubber Co., New Brunswick, N. J., and New York, N. Y.
142,344 O and C separated by representation of an eye—rubber horse-shoe pads. Vought & Williams, New York, N. Y.

Under Act of March 19, 1920, Section 1 (b)

142,373 JOHNSON'S TIRE PATCH on representation of tire-repair outfit—tire and tube repair outfits. W. S. Johnson, assignor to L. M. Wilkinson—both of St. Louis, Mo.
142,379 U-PUT-ON—rubber heels. Robert E. Miller, Inc., New York, N. Y.
142,380 MILLER—rubber baby-bibs, bathing caps, belts, and household, acid and linemen's gloves. The Miller Rubber Co., Akron, O.
142,394 STALWART—tires. G & J Tire Co., Indianapolis, Ind.

GRANTED MAY 17, 1921

Under Act of February 20, 1905

142,422 SAFETEE SHAVING BRUSH—shaving brushes with bristles set in rubber. American Safeteesoap Corporation (now by change of name Safetee Soap Corporation), Brooklyn, N. Y.
142,455 NY-CLA—hat-water, cold-water, and ice-pack bags. Russell J. Powell, Elyria, O.
142,492 DAISY—water-pistols, etc. Daisy Manufacturing Co., Plymouth, Mich.
142,516 JIFFY—tire valves. Phillip A. Erbes, San Francisco, Calif.
142,517 AVIATOR—golf balls. The Fair, Chicago, Ill.
142,519 TOPAZ—rubber sponges and sponge-rubber blocks. Featheredge Rubber Co., Inc., Chicago, Ill.
142,521 REX—hoof pads. The Federal Rubber Co., Cudahy, Wis.
142,601 MAGICTITE—tire-repair outfits. Magic Auto Supply Co., Hartford, Conn.
142,604 MALCO—windshield cleaner. The B. I. Malouf Co., Salt Lake City, Utah.
142,615 MASTER CORD—tires. The Master Tire & Rubber Co., Dayton, O.
142,737 RUSCO—suspenders, hose supporters, garters, elastic braids and cords, belts and webs. The Russell Manufacturing Co., Middletown, Conn.
142,738 RUSCO PRODUCTS—suspenders, hose supporters, garters, elastic braids and cords, belts and webs. The Russell Manufacturing Co., Middletown, Conn.
142,739 RED CLOVER CHEWING GUM—chewing gum. Floyd R. Perkins, Chicago, Ill.
142,808 TRAVEL TEX—traveling bags, brief cases, etc., of rubber and fabric. United States Rubber Co., New Brunswick, N. J., and New York, N. Y.

Under Act of March 19, 1920, Section 1 (b)

142,898 DOUBLE WELT—fabric, rubber, rubber composition, and leather shoes. Shaft-Pierce Shoe Co., Faribault, Minn.

GRANTED MAY 24, 1921

Under Act of February 20, 1905

142,937 BOY PROOF—shoes of leather, rubber and combinations with fabric and rubber fabric. The Bluff City Shoe Co., Hannibal, Mo.
142,989 CLIPPER—golf balls. Dunlop America Limited, Buffalo, N. Y.
142,990 DU PONT FABRIKOID—imitation or artificial leather. Du Pont Fabrikoid Co., assignor to E. I. du Pont de Nemours & Co.—both of Wilmington, Del.
143,010 TIREGRAM—monthly periodical. The Gardner, Moffat Co., Inc., New York, N. Y.
143,202 KING PIN—fabric and rubber boots and shoes. United States Rubber Co., New Brunswick, N. J., and New York, N. Y.
143,226 AA as monogram—rubber-covered wire for electrical purposes. A A Wire Co., Inc., Newark, N. J.

Under Act of March 19, 1920, Section 1 (b)

143,248 HOOD—tires. Hood Rubber Co., Watertown, Mass.
143,271 KORK-N-SEAL—bottle caps. The Williams Sealing Corporation, Waterbury, Conn. (See THE INDIA RUBBER WORLD, October 1, 1920, page 36.)

THE DOMINION OF CANADA

REGISTERED

28,345 Representation of an eagle on a rock, within a circle—chemicals used in the rubber industry. The Eagle-Picher Lead Co., Cincinnati, Ohio, U. S. A.
28,403 WILLARD on a band across concentric circles; THREAD RUBBER INSULATION between the circles, the letter "W" within the inner circle—storage batteries and parts made of hard rubber. Willard Storage Battery Co., Cleveland, Ohio, U. S. A.

THE UNITED KINGDOM

PUBLISHED MAY 4, 1921

394,119 REDDAWAY—mechanical rubber goods. F. Reddaway & Co., Limited, Victoria Mills, Cheltenham street, Pendleton, Manchester, Lancashire. (Mark proceeded with by order of Court under paragraph 5 of Section 9 of Trade Marks Act of 1905.)
394,120 REDDAWAY—hose of all kinds included in Class No. 50. F. Reddaway & Co., Limited, Victoria Mills, Cheltenham street, Pendleton, Manchester, Lancashire. (Mark proceeded with by order of Court under paragraph 5 of Section 9 of Trade Marks Act of 1905.)
405,979 SCHRADER—pneumatic tire valves and parts. A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn, New York, U. S. A. Address for service in the United Kingdom, care of Mewburn, Ellis & Co., 70 and 72 Chancery Lane, London, W. C. 2. (Advertised before acceptance, claiming distinctiveness.)
409,703 DRIANLITE, THE RAINCOAT OF DISTINCTION, and representation of sun setting behind body of water—raincoats. Henry Freedman, trading as H. Freedman & Co., Shannon Street Mills, Shannon street, Leeds.
409,704 THE FEATHER RAINCOAT and representation of sun setting behind body of water—raincoats. Henry Freedman, trading as H. Freedman & Co., Shannon Street Mills, Shannon street, Leeds.
410,825 "EVERY TIME.U.NEAD.IT." and representation of clock face showing hands at 12.30—preparation for repairing tube punctures and tire cuts. Garton & Co., 307 Sydenham Road, London, S. E. 26.

PUBLISHED MAY 11, 1921

402,883 ROCKBESTOS—asbestos yarn, electrical insulation material, etc. Marlin-Rockwell Corporation, 347 Madison avenue, New York, New York, U. S. A. Address for service in the United Kingdom, care of Marks & Clerk, 57 and 58 Lincoln's Inn Fields, London, W. C. 2.
405,977 SCHRADER UNIVERSAL—tire pressure gages. A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn, New York, U. S. A. Address for service in the United Kingdom, care of Mewburn, Ellis & Co., 70 and 72 Chancery Lane, London, W. C. 2. (Advertised before acceptance, claiming distinction.)
405,980 SCHRADER UNIVERSAL—pneumatic tire valves and parts. A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn, New York, U. S. A. Address for service in the United Kingdom, care of Mewburn, Ellis & Co., 70 and 72 Chancery Lane, London, W. C. 2. (Advertised before acceptance, claiming distinctiveness.)
B407,060 BANISTER, ESTABLISHED 1845, and representation of two medals and prize ribbons—leather, rubber and canvas boots, shoes, and slippers. James A. Banister Co., 370 Orange street, Newark, New Jersey, U. S. A. Address for service in the United Kingdom, care of Marks & Clark, 57 and 58 Lincoln's Inn Fields, London, W. C. 2.
407,072 BATES—tires and tubes. W. & A. Bates, Limited, St. Mary's Mills, off Narborough Road, Leicester. (Advertised before acceptance, claiming distinctiveness.)
411,737 A CHAVE and representation of a key—rubber-insulated electric cables. Callender's Cable & Construction Co., Limited, Hamilton House, Victoria Embankment, London, E. C. 4.
412,319 BELLERITE—ebonite compound for heat insulating. Barrett & Elers, Limited, 127 and 129 Wallis Road, Hackney Wick, London, E. 9.
412,997 ST. BERNARD and representation of a St. Bernard monk—elastic webs included in Class No. 40. G. E. Bernard, 30 Edmund Place, London, E. C. 1.
413,468 ECLIPSE—surgical or curative unmedicated instruments, apparatus and contrivances. J. G. Ingram & Son, Limited, The London India-Rubber Works, Felstead street, Hackney Wick, London, E. 9.
B413,935 GANDY—rubber or balata machine belting. The Gandy Belt Manufacturing Co., Limited, Wheatland Works, Wheatland Lane, Seacombe, Cheshire.

NEW RULINGS ON CANADIAN PATENTS

Under date of June 6, 1921, George F. O'Halloran, Commissioner, has promulgated the following ruling relating to Canadian patents:

Under the tariff as amended by Act of Parliament passed on June 4, 1921, the fees for the full term of the patent are now $35, of which $15 is payable on filing the application and $20 on the grant of the patent. To complete these fees, $15 must be paid not later than six months from the date of the notice of allowance. In order that this payment may be completed, allowed applications are withheld from issue, and consequently, the weekly issue of the *Canadian Patent Office Record* will be discontinued for a short period.

VULCANIZATION ACCELERATOR PATENTS

THE UNITED STATES

PATENT NUMBER	PATENTEE	ASSIGNEE	MATERIAL
1,081,613	Hoffman and Dibruche	Bayer & Co.	Basic materials in synthetic rubber.
1,126,469	Hoffman and Gottlob	Synthetic Patents Co.	Piperidine.
1,130,903	Hoffman and Gottlob	Synthetic Patents Co.	Piperidine or methylene base in synthetic rubber.
1,149,580	Hoffman and Gottlob	Synthetic Patents Co.	Basic bodies of dissociation constant 10^{-9}.
1,157,177	S. J. Peachey		Para-nitroso bodies.
1,182,501	P. I. Murrill	Morgan & Wright	Bone oil.
1,229,724	E. de Meeus	Beacons Falls Rubber Co.	Aromatic bases.
1,242,586	I. Ostromislensky	New York Belting & Packing Co.	Halide or chloride of rubber.
1,242,886	E. Meyer	Morgan & Wright	Aniline and petrolatum.
1,247,257	H. A. Gardner		Zirconium and amines.
1,249,180	I. Ostromislensky	New York Belting & Packing Co.	Tri-nitro-benzene naphylamin.
1,249,181	I. Ostromislensky	New York Belting & Packing Co.	Oxidation of rubber.
1,249,272	C. R. Boggs	Simplex Wire & Cable Co.	Selenium and β-naphthylamin.
1,271,810	D. F. Twiss	Dunlop Rubber Co.	Glycerine and caustic soda.
1,280,940	C. E. Andrews	Walker Chemical Co.	Amines, methyl-isopropyl-benzene, amino cymene.
1,291,828	W. A. Gibbon	New York Belting & Packing Co.	β-dinitro-anthraquinone.
1,296,469	C. R. Boggs	Simplex Wire & Cable Co.	β-naphthylamine.
1,312,007	S. P. Thatcher	Revere Rubber Co.	Organic vulcanizing agent and red lead.
1,312,744	S. P. Thatcher	United States Rubber Co.	Nitrobenzol, red lead and organic accelerators.
1,320,166	I. Ostremislensky	New York Belting & Packing Co.	Oxygen-carrying compounds and amines.
1,323,951	C. W. Bedford	The Goodyear Tire & Rubber Co.	Product of hydrolytic decomposition of a proteid.
1,342,457	I. Ostromislensky	New York Belting & Packing Co.	Methylene bases and other accelerators that do not destroy coloring matter.
1,342,458	I. Ostromislensky	New York Belting & Packing Co.	Oxygen-carrying compound.
1,343,224	S. B. Molony	Michigan Chemical Co.	Sugar beet residues containing amines; dithiocarbamic compounds.
1,350,824	E. Meyer	Morgan & Wright	Caustic soda solution.
1,356,495	W. Scott	The Goodyear Tire & Rubber Co.	Carbon di-sulphide addition to o-toluidine.
1,364,055	C. R. Boggs	Simplex Wire & Cable Co.	All primary and secondary amines with selenium.
1,364,732	De Leng and Watson		Dichlor-aniline.
1,371,662 1,371,663 1,371,664	C. W. Bedford	The Goodyear Tire & Rubber Co.	Sulphur addition products such as sulphur and thiocarbanilide, sulphur and hexamethylene-tetramine, etc.

THE DOMINION OF CANADA

168,806	S. J. Peachey		P-nitroso-dimethylaniline or its homologs.
179,352	I. Ostromislensky	William E. Lake	Mono-cyclic aromatic compounds in the presence of litharge and of an aromatic amine.
179,353	I. Ostromislensky	William E. Lake	Sulphur, an organic dye and a metallic oxide.
179,354	I. Ostromislensky	William E. Lake	Benzoyl peroxide.
179,355	I. Ostromislensky	William E. Lake	Sulphur and tri-nitro benzene.
179,356	I. Ostromislensky	William E. Lake	Chlorine compound of rubber.
173,739	I. Ostromislensky	William E. Lake	Vulcanizing dye containing a nitro group in the presence of lead oxide and naphthylamine.
181,461	Whittley	Canadian Consolidated Rubber Co.	Sulphur chloride, aniline and benzol.
185,137	D. F. Twiss	Dunlop Rubber Co.	Glycerine and caustic soda.
190,042	D. F. Twiss	Dunlop Rubber Co.	Sodium in aniline, potassium in diphenylene or toluidine.
190,352	Gibbons	Canadian Consolidated Rubber Co.	β-dinitro anthraquinone.
192,470	D. F. Twiss	Dunlop Rubber Co.	Caustic alkali dissolved in an organic compound other than glycerol or glycol, of predominant hydroxylic character such as butyl or amyl alcohol or phenol.
204,387	B. D. Porritt	North British Rubber Co.	Anhydrous compound made from a base and the monophydroxy derivative of benzene in which the H of the OH is replaced by the base.
204,779	Chester E. Andrews	Selden Co.	Amines—methyl-isopropyl-benzene.
205,728	Eloi Ricard	Soc. Ricard, Allenet & Cie.	Nitrogen derivative of furfuryl.
207,718	W. Scott	The Goodyear Tire & Rubber Co.	Aryl substituted thiourea with aryl group in ortho position.
207,982	Bedford and Sibley	The Goodyear Tire & Rubber Co.	Base resulting from reacting on P-nitroso-dimethylaniline in an inactive solvent with hydrogen sulphide.
207,983	Bedford and Sibley	The Goodyear Tire & Rubber Co.	Substituted di-thiourea.
211,926	S. B. Molony	Michigan Chemical Co.	Alkylated, dialyated or methylated dithiocarbamic acid.
211,927	S. B. Molony	Michigan Chemical Co.	Alkylated, methylated or mono-methyl dithiocarbamate of a metal.
211,928	S. B. Molony	Michigan Chemical Co.	Methyl ester of phenyl dithiocarbamic acid; metallic salts of phenylated dithiocarbamic acid; or metallic salts of phenyl dithiocarbamic acid.

GREAT BRITAIN

APPLICATION NUMBER			
11,530—1912	Bayer & Co.		Piperidine and homologs.
11,615—1913	Bayer & Co.		Non-volatile derivatives of fugitive bases.
12,777—1913	Newton		Aliphatic bases, difficultly volatile derivatives of easily volatile bases.
4,263—1914	S. J. Peachey		P-nitroso-dimethylamine bodies.
7,370—1914	S. J. Peachey		Aromatic amines and aliphatic or aromatic aldehydes or an aromatic aldehyde with ammonia, e. g., hydrobenzamide.
10,833—1914	S. J. Peachey		P-nitroso-diphenylamine.
12,661—1914	Bayer & Co.		Sodium amide, quaternary bases, aldehyde ammonia and phenylenediamine.
17,760—1915	D. F. Twiss	Dunlop Rubber Co.	Amino guanadine carbonate.
SERIAL NUMBERS			
101,819—1916	S. J. Peachey		Nitro-phenols or their homologs.
108,300—1916	I. Ostromislensky	New York Belting & Packing Co.	Dinitrobenzene and red lead.
110,509—1916	D. F. Twiss	Dunlop Rubber Co.	Alkali glyceroxide.
111,257—1918	Barton and Gardner		Titanic oxide and calcium sulphate.
113,570—1918	S. J. Peachey		Para-nitroso dimethylaniline or its homologs and sulphur.
124,276—1919	D. F. Twiss	Dunlop Rubber Co.	Caustic alkali dissolved in an organic compound other than glycerol or glycol, of predominant hydroxylic character such as butyl or amyl alcohol or phenol.
126,606—1919	J. F. B. Van Hosselt		Nitroso bodies with aromatic bases.
129,798—1919	B. D. Porritt	North British Rubber Co.	Sodium phenate bases and mono-hydroxy derivatives of benzene.
130,857—1919	The Goodyear Tire & Rubber Co.	North British Rubber Co.	Sulphur reaction bodies from nitrogen bodies.
136,716—1920	S. J. Peachey		Nitroso hydrocarbons of the benzene series.

GREAT BRITAIN—(Continued)

SERIAL NUMBERS	ASSIGNEE	MATERIAL
140,387—1919 140,388—1919	G. Bruni G. Bruni	Addition salts of mono- or di-substituted dithiocarbamic acids and di- or tri-valent metals or inorganic radicles, e. g., pentamethylene dithio-carbamate of zinc.
142,083—1920	A. Heilbronner	Organic or inorganic reducing agents, e. g., paramidophenol derivatives, tannin, etc.
146,734—1920	S. J. Peachey	Nitroso hydrocarbons of the benzene series.
146,869—1920	Meister, Lucius & Browning	Pyridine bases.
147,090—1920	Meister, Lucius & Browning	Pyridine bases.
148,349—1920	E. Tilche	Vulcanization in an atmosphere of ammonia or a volatile organic ammonia compound.
148,350—1920	E. Tilche	Carbon disulphide addition to an ortho-alkyl substituted aromatic amine, e. g., di-orthotoluyl thiourea.
153,890—1920	The Goodyear Tire & Rubber Co.	
157,050—1921	Société R. Allenet & Cie	Furfuramide and other nitrogen derivatives of furfuryl, in particular the condensation products of pyromucic aldehyde with ammonia or amines.

FRANCE

470,883	Bastide	Amines as solvents for sulphur.
490,897	S. J. Peachey	P-nitroso bodies.

GERMANY

265,221	Bayer & Co.	Fiperidine.
266,618	Bayer & Co.	Piperidine.
269,512	Bayer & Co.	Addition products of carbon disulphide and dimethylamine.
273,482	W. Esch	Albumen.
280,193	Bayer & Co.	P-phenylene diamine.
303,984 305,667	Bayer & Co.	All amines up to five per cent addition of ammonium compounds and or aniline sulphate.
325,306	J. F. B. von Hasselt	Nitroso bodies with aromatic bases.

AUSTRIA

68,724—1914	Bayer & Co.	Urea derivatives of the amines and carbon disulphide addition products.

HOLLAND

2,829—1919	S. J. Peachey	Para-nitroso-dimethylaniline.

BELGIUM

262,299	Newton	Aromatic bases, difficultly volatile derivatives of easily volatile bases.

JAPAN

34,944	D. F. Twiss	Dunlop Rubber Co.	Solution of sodium or potassium in primary or secondary amines.

OCEAN RATES FROM NEW YORK ON TIRES, TUBES, MECHANICAL GOODS, CLOTHING, FOOTWEAR AND DRUGGISTS' SUNDRIES[1]

(Same rates apply from other Atlantic ports where service is available.)

COUNTRY AND PORT	RATES Cu. Ft.	RATES 100 lbs.
AFRICA		
AFRICA, EAST COAST—		
Beira	..	*$26.00
Plus landing charges $0.30 per ton.		
Klidini	..	*34.00
Delagoa Bay Lourence Marques	..	*25.40
Mauritius	..	*30.00
NORTH COAST—		
All Ports	..	*22.00
EGYPT—		
Alexandria	..	*22.00
SOUTH COAST—		
Algoa Bay	..	*23.60
Capetown	..	*23.00
East London	..	*24.20
Port Natal	..	*24.80
WEST COAST—		
Accra-Lagos Secondi Buruttu	..	*30.00
Dakar Freetown	..	*28.00
Boma Matadi	..	*32.00
ASIA		
CHINA—		
Hongkong Shanghai	..	*23.00
INDIA—		
All direct ports	..	*21.00
Madras Rangoon	..	*23.00
JAPAN—		
All direct ports	..	*23.00
JAVA—		
All ports	..	*21.00
MANCHURIA—		
Dalny	..	*24.00
PHILIPPINES—		
Manila	..	*23.00
STRAITS SETTLEMENTS—		
Singapore Penang	..	*21.00
SYRIA—		
Beyrout	..	*24.00
CENTRAL AMERICA		
COSTA RICA—		
Port Limón	$.64	1.31
MEXICO—		
Tampico	.52½	1.05
Plus 2½c. per 100 lbs. bar dues.		
Vera Cruz Puerto Mexico	.52½	1.05
EUROPE		
BELGIUM—		
Antwerp	.40	.75
BRITISH ISLES—		
All ports	.45	.85
Except rubber belting	.50	1.00
CANARY ISLANDS—		
Las Palmas	..	*25.00
DENMARK—		
Copenhagen	.55	1.00
ESTHONIA—		
Reval	.75	1.50
FINLAND—		
Helsingfors	.75	1.50
FRANCE—		
All Atlantic ports	.40	.75
Marseilles	..	*22.00
GERMANY—		
Hamburg Bremen	.45	.82½
Danzig	.50	.90
GREECE—		
All ports	..	*22.00
HOLLAND—		
Rotterdam	.40	.75
Amsterdam	.40	.75
ITALY—		
Direct ports	.50	1.00
Fiume Trieste Venice	..	*26.00
NORWAY—		
All ports	.55	1.00
PORTUGAL—		
Lisbon	..	*20.00
Oporto	..	*25.00
RUMANIA—		
All ports	..	*25.00
SPAIN—		
All ports	..	*20.00
Gibraltar	.65	1.20
SWEDEN—		
Malmo Stockholm	.. .65	1.25
Gothenburg	.55	1.00
SOUTH AMERICA		
ARGENTINA—		
Buenos Aires	..	*20.00
Rosario	..	*27.50
BRAZIL—		
Rio de Janeiro	..	*22.50
Santos	..	*20.00
Bahia	..	*24.00
Pernambuco	..	*23.50
CHILI—		
All ports	.74	1.32
COLOMBIA—		
Cartagena Puerto Colombia Santa Marta	.51	1.12
Plus government charges.		
Buenaventura—		
(via direct steamer)	1.03	1.84
(via transshipment)	.98	1.75
ECUADOR—		
Guayaquil—		
(via direct steamer)	.74	1.32
via transshipment)	.70	1.25
PERU—		
Callao Mollendo	.74	1.32
URUGUAY—		
Montevideo	..	*20.00
VENEZUELA—		
La Guayra	.40	.65
Plus 4c per 100 kilos landing charge, plus 40% surcharge.		
NEW ZEALAND—		
All ports	..	*30.00
WEST INDIES		
BERMUDA—		
Hamilton	.37	.75
Grenada St. Croix St. Thomas St. Kitts	.50	1.00
Port of Spain	.40	.75
CUBA—		
Havana	.47	.94
Plus 30c per 100 lbs. Cuban wharfage and handling charges.		
Santiago	.59	1.18
Cienfuegos	.61	1.21
CURACAO—		
Curacao	.30	.65
Plus 40% surcharge.		
JAMAICA—		
Kingston	.42	.84
PORTO RICO—		
All ports	.31	.75
San Juan landing charge 1c per ft., or 2½c per 100 lbs. additional.		
SANTO DOMINGO—		
Santo Domingo	.51	.91

[1]Compiled by Austin Baldwin & Co., Inc., 44 Whitehall st., New York, N. Y.

*Rate is figured on ton of 40 cubic feet or 2,240 lbs.

Review of the Crude Rubber Market

NEW YORK

THE lowest price records in the history of crude rubber were made during the past month when first latex crêpe sold for 13½ cents and ribbed smoked sheets were sold for 11½ cents. The market has been in a practically demoralized condition throughout the month, due to the distressed stocks that were thrown on the market and sold at a sacrifice. Good factory business was eagerly solicited and there was strong competition among dealers to secure the business, however small.

On June 4, first latex crêpe, spot was quoted 17 cents, ribbed smoked sheet, 14 cents, and upriver fine, 17 cents. In a generally dull and inactive market with small interest shown in futures, values steadily declined, and on June 23, first latex spot had reached the low mark of 13½ cents, ribs were 11½ and upriver fine, 15 cents.

While ruling conditions are very unfavorable and lower values may be recorded, there is undoubtedly a better outlook than there was a month ago. The larger Akron tire companies are recovering from the temporary setback of last month and are increasing production. It is reported that Goodyear has put on three shifts a day, and many of the medium-sized factories are running 60 per cent of normal and some are at full production. The effect of this improved condition in Akron must be reflected in the rubber market sooner or later.

Imports of all grades during May were 10,732 tons, compared with 27,338 tons last year. Plantation arrivals for May were 9,127 tons, compared with 24,443 tons a year ago. Total imports of all grades for the five months ended May 31, 1921, were 65,235 tons, compared with 137,008 tons for the same period in 1920.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATIONS, June 4. Spot first latex crêpe, 17 cents; July—September, 17¼ cents; October—December, 18½ cents. June 22. Spot first latex crêpe, 14 cents; July—September, 15 cents; October—December, 16 cents; January—March, 17 cents.

June 4. Spot ribbed smoked sheets, 14 cents; July—September, 15 cents; October—December, 16½ cents. June 22. Spot ribbed smoked sheets, 12 cents; July—September, 13 cents; October—December, 14 cents; January—March, 15 cents.

June 4, Spot, No. 1 amber crêpe, 12½ cents; July—September, 13 cents; July—December, 13½ cents. June 22. Spot, No. 1 amber crêpe, 12 cents; July—September, 12 cents; October—December, 12½ cents; January—March, 14 cents.

June 4. Spot, No. 1 rolled brown crêpe, 10¼ cents; July—September, 10½ cents. June 22. Spot No. 1 rolled brown crêpe, 9 cents; July—September, 9¼ cents; October—December, 9¾ cents; January—March, 10½ cents.

SOUTH AMERICAN PARÁS AND CAUCHO. June 4. Spot, upriver fine, 17 cents; islands fine, 17½ cents; upriver coarse, 8¼ cents; islands coarse, 9 cents; Cametá, 8 cents; caucho ball, 10½ cents. June 22. Spot, upriver fine, 15½ cents; islands fine, 17 cents; upriver coarse, 7½ cents; islands coarse, 9 cents; Cametá, 8 cents; caucho ball, 7 to 9 cents.

NEW YORK QUOTATIONS

Following are the New York spot quotations, for one year ago, one month ago, and June 22, the current date:

	July 1, 1920	June 1, 1921	June 22, 1921
PLANTATION HEVEA			
First latex crêpe	$0.35 @.36	$0.17 @	$0.14½ @
Off latex crêpe	@	.15 @.15½	.13 @
Amber crêpe No. 1	.38 @	.13 @	.12 @
Amber crêpe No. 2	.35 @.36	.12 @	.11 @
Amber crêpe No. 3	.34 @.35	.11 @	.10 @
Brown crêpe, thick and thin	.33 @.35	.12½ @	.12½ @
Brown crêpe, specky	.31 @	.11 @	.09 @
Brown crêpe, rolled	.30 @	.10 @.10½	.09 @
Smoked sheet, ribbed	.35 @	.14½ @	.12 @.13½
Smoked sheet, plain	.36 @	.13 @	.11 @
Unsmoked sheet	.33 @	.12 @	.10 @
Colombo scrap No. 1	.30 @	@	.08 @
Colombo scrap No. 2	.28 @	@	.07 @
EAST INDIAN			
Assam crêpe	@	@	@
Assam onions	@	@	@
Penang block scrap	@	@	@
PONTIANAK			
Banjermassin	.12½ @	.06¼ @	.06½ @
Palembang	@	.07½ @	@
Pressed block	.24 @	.11½ @	.11 @
Sarawak	@	.05¼ @	.05½ @
SOUTH AMERICAN			
PARAS			
Upriver, fine	.35 @.36	.16½ @.17	.15 @.16
Upriver, medium	.34 @	.13½ @.14	.13 @.14
Upriver, coarse	.26 @	.08½ @.08¾	.07 @.08
Upriver, weak, fine	.33 @	.13 @	.12 @
Islands, fine	.37 @	.18½ @.19	.17 @
Islands, medium	.35 @	.14 @.15	.13 @
Islands, coarse	.21 @	.09 @.09½	.09 @
Cametá	.20 @.20½	.08½ @	.08 @
Acre Bolivian, fine	.39 @	.17 @.18½	.16 @.16½
Madeira, fine	.40 @	.19 @.20	.18 @.19
Peruvian, fine	*.36½ @	.16½ @.17	.15 @
Tapajos, fine	*.36 @	.16½ @.17	.15 @
CAUCHO			
Upper caucho ball	.29 @	.10¼ @.11½	.09 @.10
Lower caucho ball	.27 @.28	.09½ @.10	.07 @
MANICOBAS			
Ceará negro heads	.25 @	.12 @	*.10 @
Ceará scrap	.18 @	.06 @	*.04 @
Maniçoba, 30% guarantee	.24 @	.11 @	*.10 @
Mangabeira thin sheet	.30 @	.13 @	*.12 @

	July 1, 1920	June 1, 1921	June 22, 1921
CENTRALS			
Corinto scrap	.22 @	.11 @.11½	.06 @.08
Central scrap	.21 @.22	.10 @.11	.06 @.08
Central scrap and strip	.19 @.20	.06 @.07	.06 @.08
Central wet sheet	.15 @	.04 @	.03 @.04
Esmeralda sausage	.22 @	.11 @.12	.06 @.08
Guayule, 20% guarantee	.27 @	@	@
Guayule, washed and dried	.37 @	.26 @	.26 @
AFRICANS			
Benguela, No. 1, 28½%.	.21 @	.08 @	.04 @
Benguela, No. 2, 32½%	.19 @	@	@
Conakry niggers	.33 @	@	@
Congo prime, black upper	.19 @	@	@
Congo, prime, red upper	@	@	@
Kassai, black	@	@	@
red	.35 @	@	@
Massai sheets and strings	.33 @	@	@
Niger flake, prime	.16 @	.13½ @	@
Rio Nunez ball	.35 @	@	@
Rio Nunez sheets, strings	.34 @	@	@
GUTTA PERCHA			
Gutta Siak	.26 @	.13¼ @ .15	.13½ @ .14
Red Macassar	2.75 @	2.30 @2.65	1.50 @ 2.00
BALATA			
Block, Ciudad, Bolivar	.72 @	.53 @	.51 @ .54
Colombia	.47 @	.43 @	.35 @ .38
Panama	@	.43 @	.25 @ .35
Surinam sheet	.79 @	.74 @	.65 @ .70
amber	.82 @	.81 @	.67 @ .73

*Nominal.

RECLAIMED RUBBER

The market position of reclaimed rubber has been still marked by the recession in crude rubber to new low figures. Production has been curtailed by all reclaimers to meet the hand-to-mouth demand of the rubber manufacturers, who continue to operate on schedules greatly reduced from their normal capacities. Although many of their plants are closed down, reclaimers are optimistic enough to believe in the certain revival of their trade with the resumption of normal production in the manufacturing divisions of the rubber industry.

There is considerable movement of rubber shoddy in less than carloads between factories, and the consolidated classification now requires this article to be shipped in bags, bales, barrels or

boxes, but the official classification committee will establish regulations permitting the shipment of rubber shoddy in less than carloads between points in official classification territory (points east of the Mississippi and north of the Ohio rivers) when shipped in rolls or slabs.

NEW YORK QUOTATIONS

JUNE 24, 1921.

Prices subject to change without notice

STANDARD RECLAIMS			
Floating	$0.14	@	$0.16
Friction	.14	@	.16
Mechanical	.09	@	.11
Shoe	.11¼	@	.12¼
Tires, auto	.11¼	@	.13¼
truck	.09	@	.11
White	.14	@	.15

AMSTERDAM RUBBER MARKET

JOOSTEN & JANSSEN, Amsterdam, report, under date of June 3, 1921: Prices this week fluctuated within narrow limits at about last closing prices. The turnover in spot lots was poor and only moderate in futures, the tone mostly dull. The close was steady at about following prices:

Crêpe, Fl. .43 — Sheets, Fl. .39 on the spot.
Crêpe, Fl. .46½ — Sheets. Fl. .41½ July—September.
Crêpe, Fl. .49 — Sheets, Fl. .44 October—December.

ANTWERP RUBBER MARKET

OSTERRIETH & CO., Antwerp, report under date of June 3, 1921:

The market today is slightly lower than a week ago, and the demand and volume of business are very small. For distant positions there is as little inquiry as for near, and unless there is either an early resumption of buying or an effective curtailment of production it will be difficult to maintain prices even on their present basis. In this respect it is rather encouraging to note that for the first time for one year past, the actual deliveries in London exceed the quantity landed, although to a small extent only. The last quotations of the week are:

	Crêpes, Francs per Kilo	Sheets, Francs per Kilo
June, 1921	3.65	3.35
July	3.75	3.45
August	3.85	3.45
September	3.95	3.45
October	4.05	3.55
November	4.15	3.60
December	4.25	3.60
January, 1922	4.35	3.60
February	4.35	3.60
March	4.35	3.60
April	4.35	3.60
May	....	....

During the past week buyers have shown practically no interest for Congo sorts, the quantity of which has been increased by some 20 tons arrived by the S.S. "Mayumbe," from Belgian Congo. As a matter of interest we may mention the sale of some small lots of red Congo Kassai (barky) at 2.25 to 2.75 francs per kilo; for red Congo thimbles there seems to be some interest at about 0.50-franc per kilo.

Stock today: about 1,856 tons, plantation and Congo.

SINGAPORE RUBBER MARKET

GUTHRIE & CO., Limited, Singapore, report under date of May 12, 1921:

There was a good attendance of buyers at the weekly auctions held yesterday and to-day, and demand was more active than has been the case for some time past. No sales of standard quality rubber fail to be recorded, sellers withdrawing at sheet 30 cents and crêpe 32½ cents. The demand for standard pale crêpe has fallen off, and the heavy premium recently paid for this grade has been considerably reduced. F. A. Q. sheet was in better demand and advanced 1½ cents on the week. The feature of the sale was the keen inquiry for off latex crêpe, which sold freely from 21½ to 32 cents. Browns were in good demand at 1½ to 2 cents up, while dark and barky crêpes advanced 2 to 4 cents. Values declined towards the close of the sale on weaker advices from London and New York; 863 tons were catalogd, and 496 tons sold. The following is the course of values:

	In Singapore per pound	Sterling Equivalent per pound in London
Sheet, good ribbed smoked	16 @ 30	—/ 6⅛ @ —/10½
Crêpe, good pale	21 @ 32	—/ 8⅜ @ —/11⅜
Crêpe, fine brown	19½ @ 23	—/ 8 @ —/ 9
Crêpe, good brown	13½ @ 19	—/ 6¾ @ —/ 7⅜
Crêpe, dark	10½ @ 16½	—/ 5½ @ —/ 7⅛
Crêpe, bark	9½ @ 13½	—/ 5⅛ @ —/ 6⅜

COMPARATIVE LOW AND HIGH NEW YORK SPOT RUBBER PRICES

	June 1921*	June 1920	June 1919
PLANTATIONS			
First latex crêpe	$0.14 @ $0.17½	$0.37½ @ $0.39	$0.40 @ $0.45
Smoked sheet ribbed	.12 @ .14¾	.37¼ @ .39	.39 @ .44
PARAS			
Upriver, fine	.15½ @ .18	.36¾ @ .38½	.55½ @ .56¾
Upriver, coarse	.07 @ .09¼	.27¼ @ .28¾	.32½ @ .34¾
Islands, fine	.16 @ .18	.38 @ .40½	.47 @ .47½
Islands, coarse	.07 @ .09	.21 @ ...	.21 @ .22
Cametá	.07½ @ .09	.21 @ .23	.22 @ .23

*Figured to June 22, 1921.

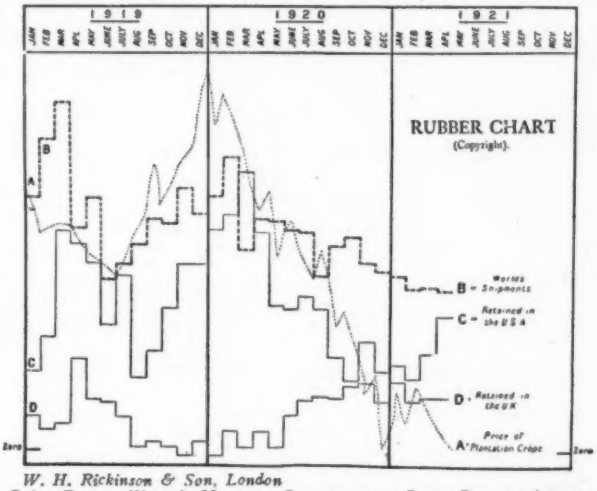
PLANTATION RUBBER PRICE FLUCTUATIONS

The following chart and key were published as a supplement to *The World's Rubber Position*, May, 1921, showing the fluctuations in prices of rubber, shipments and stocks:

KEY TO THE CHART

(*A*) Fluctuations in the price of plantation crêpe rubber, each horizontal line representing one penny per pound. Zero line commences at 10*d.* per pound.

(*B*) The World's monthly shipments of plantation, Brazilian and other kinds of rubber from the producing countries, each horizontal line above zero representing 2,000 tons.



W. H. Rickinson & Son, London

CRÊPE PRICES, WORLD'S MONTHLY SHIPMENTS OF CRUDE RUBBER, AMOUNT RETAINED MONTHLY IN THE UNITED STATES AND THE UNITED KINGDOM.

(*C*) Amount of rubber retained monthly in the United States of America, each horizontal line above zero representing 2,000 tons.

(*D*) Amount of rubber retained monthly in the United Kingdom, each horizontal line above or below zero representing 2,000 tons.

In studying the chart it will be seen that to effect an improvement in the price of rubber either line *B* must fall or line *C* rise considerably, and the longer the line *D* is maintained about its present position the greater must be this fall or rise.

NEW YORK AVERAGE SPOT RUBBER PRICES

Prices in Cents Per Pound

	MAY, 1921													JUNE, 1921									
	16	17	18	19	20	21	23	24	25	26	27	*28	30†	31	1	2	3	4	6	7	8	9	10	11	13	14
PLANTATIONS:																										
Sheet:																										
Ribbed smoked	16¼	16½	16¼	16	15⅞	15⅞	15⅝	15¼	14¾	14⅛	14⅜	...	...	14¼	14¼	13⅞	13¾	13¾	13⅞	13¼	12¾	12¼	11¾	11¾	12	12⅜
Crêpe:																										
First latex	18¼	18¼	18¼	18	17¾	17¾	17¾	17¾	17¼	16¼	17	...	...	16⅜	16⅝	16¼	16	16	15¾	15¼	14¾	14¼	13⅝	13¾	13⅞	14¼
Off latex	16½	15¾	16	15⅝	15⅝	15½	15¾	15¾	15½	14	15	...	...	14⅝	14½	14¾	14½	14½	14½	13⅝	13½	13¾	13	13	12¼	13
No. 1 blanket	14¼	14¼	14¼	14½	14¼	14¼	13¾	13¾	13½	13¼	13¼	...	...	13¼	12¾	12¾	12¾	12¾	12¼	12¼	11¾	11¾	11¼	11½	11¼	11⅜
No. 2 blanket	13½	13½	13½	13½	13½	13¼	12¾	12¾	12½	12½	12¾	...	...	12¼	11¾	11¾	11¾	11¾	11¼	11¼	10¾	10¾	10¼	10½	10⅝	10¾
No. 3 blanket	12¼	12¼	12¼	12½	12¼	12¼	11¾	11¾	11¼	11¼	11½	...	...	11¼	10¾	10¾	10¾	10¾	10¾	10½	9¾	9¾	9¼	9¼	9¾	10½
Clean, thin, brown	13¼	13¾	13¾	13½	13½	13½	13½	13½	12⅝	12¼	12½	...	...	12½	12¼	12¾	12½	12½	12	12¼	11¾	12¼	10⅞	10⅞	10¼	11⅝
Specky brown	12¼	12¼	12¼	12½	12½	12¼	11½	11¼	10¾	11¼	10½	...	...	10½	10½	10⅜	10½	10½	10⅜	10¾	9¾	10	9⅛	9⅛	8¾	9¼
Rolled brown	11	11	11	10¾	10¾	10¾	10¾	10½	10⅜	10¾	10⅝	...	...	10¼	9¾	10	9¾	9¾	10	9⅜	9¼	9	8¼	8¼	8¾	8⅞

*Trade closed. †Holiday.

PLANTATION RUBBER EXPORTS FROM MALAYA

(These figures include the production of the Federated Malay States, but not of Ceylon.)

	January 1 to February 28, 1921			January 1 to May 12, 1921 Port	
	Singapore	Malacca	Penang	Swettenham	Totals
To United Kingdom...*pounds*	8,760,940	1,704,487	3,483,100	7,836,821	21,785,348
The Continent..	2,408,539	1,739,485	23,067	44,800	4,215,891
Japan	7,658,201	.....	.....	.....	7,658,201
Ceylon	.....	.....	46,800	170,281	217,081
United States and Canada	8,474,495	15,640	110,067	.....	8,600,202
Australia	356,495	806	.....	.....	357,301
Other countries.	.....	.....	796,533	.....	796,533
Totals...*pounds*	27,658,670	3,460,418	4,459,567	8,051,902	43,630,557

Compiled by Barlow & Co., Singapore.

FEDERATED MALAY STATES RUBBER EXPORTS

An official report from Kuala Lumpur states that 7,444 tons of rubber were exported from the Federated Malay States in April, as against 7,408 tons in March and 8,375 tons in the corresponding month last year. The total exports for four months of the current year amount to 28,028 tons compared with 38,799 tons last year and 36,315 tons in 1919. Appended are the comparative statistics:

	1919	1920	1921
January .....*tons*	7,163	11,119	7,085
February	10,809	9,781	6,091
March	10,679	9,524	7,408
April	7,664	8,375	7,444
Totals .....*tons*	36,315	38,799	28,028

STRAITS SETTLEMENTS RUBBER EXPORTS

It is announced by official report from Singapore that 6,091 tons of rubber were exported from Straits Settlements ports in the month of April, as compared with 7,275 tons in March and 9,768 tons in the corresponding month last year. Transhipments amounted to 1,246 tons. The total exports for four months of the current year amount to 24,988 tons as against 46,203 tons last year and 61,821 tons in 1919. Appended are the comparative statistics.

	1919	1920	1921
January .....*tons*	14,404	13,125	5,809
February	15,661	17,379	5,813
March	20,908	5,931	7,275
April	10,848	9,768	6,091
Totals .....*tons*	61,821	46,203	24,988

These figures include transhipments of rubber from various places in the neighborhood of the Straits Settlements, such as Borneo, Java, Sumatra and the non-Federated Malay States as well as rubber actually exported from the Colony, but do not include rubber exports from the Federated Malay States.

PLANTATION RUBBER EXPORTS FROM JAVA*

	March		Three Months Ended March	
	1920	1921	1920	1921
To Netherlands.....*kilos*	463,000	627,000	1,058,000	2,161,000
Great Britain.....	157,000	433,000	1,167,000	2,256,000
Germany	.....	55,000	.....	117,000
Belgium	.....	.....	.....	5,000
Italy	.....	.....	.....	1,000
United States.....	1,397,000	739,000	4,674,000	1,903,000
Singapore	430,000	294,000	1,171,000	925,000
Japan	102,000	52,000	131,000	95,000
Australia	.....	6,000	.....	208,000
Totals .....*kilos*	2,549,000	2,206,000	8,201,000	7,671,000
Ports of origin:				
Tandjong Priok.....*kilos*	1,469,000	1,033,000	4,052,000	3,620,000
Samarang	17,000	72,000	149,000	126,000
Soerabaya	1,043,000	883,000	3,735,000	3,242,000

*The February figures are verified.

CEYLON RUBBER EXPORTS

	January 1, to April 27	
	1920	1921
To United Kingdom.....*pounds*	11,744,668	12,710,335
Belgium	25,100	249,904
France	223,107	306,120
Germany	90,308	1,448,252
Holland	28	355,987
Denmark	.....	51,565
Italy	67,200	90,720
Norway	.....	2,240
Victoria	3,200	107,970
New South Wales.....	96,680	62,680
United States.....	15,872,411	14,530,763
Canada and Newfoundland.....	425,600	419,148
India	336	3,652
Straits Settlements.....	44,800	.....
Japan	155,427	105,426
Totals .....*pounds*	28,748,865	30,444,762

Compiled by the Ceylon Chamber of Commerce.

RUBBER EXPORTS FROM PENANG

	January 1, to April 30	
	1920	1921
To Great Britain.....*piculs*[1]	78,968	65,634
Europe	851	509
United States.....	74,707	2,504
Totals .....*piculs*[1]	154,526	68,647

[1] One picul equals 133⅓ pounds.

CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS

PARAS AND CAUCHO AT NEW YORK

	Fine	Medium	Coarse	Caucho	Totals Pounds
MAY 31. By the S. S. "Byron" from Brazilian Ports.					
H. A. Astlett & Co.....	35,000	.....	.....	.....	35,000
Poel & Kelly.....	37,696	9,571	11,516	.....	58,783
JUNE 9. By the S. S. "La Place" from Pará.					
Poel & Kelly.....	171,006	723	.....	.....	171,729
H. A. Astlett & Co.....	160,000	.....	.....	.....	160,000
Meyer & Brown, Inc.....	53,760*	.....	.....	.....	53,760
JUNE 14. By the S. S. "Denis" from Manáos.					
G. Amsinck & Co., Inc.....	.....	.....	.....	.....	18,429
Arkell & Douglas, Inc.....	.....	.....	.....	.....	13,400
Meyer & Brown, Inc.....	78,400*	.....	.....	.....	78,400
Various	.....	.....	.....	.....	159,858
JUNE 14. By the S. S. "Denis" from Iquitos.					
W. R. Grace & Co.....	.....	.....	.....	.....	7,506

*Includes medium.

PLANTATIONS

(Figured at 180 pounds net to the bale or case.)

	Shipment from:	Shipped to:	Pounds.	Totals.
MAY 19. By the S. S. "Eclipse" at New York.				
General Rubber Co.....	Belawan	New York	1,128,240	
Various	Belawan	New York	18,815	
J. T. Johnstone & Co., Inc.	Penang	New York	39,600	
Mitsui & Co., Limited....	Batavia	New York	55,980	
F. R. Henderson & Co...	Batavia	New York	113,220	
William H. Stiles & Co...	Batavia	New York	45,254	
Winter, Ross & Co.....	Batavia	New York	2,520	
Stein, Hall & Co., Inc....	Batavia	New York	19,980	
Various	Batavia	New York	21,346	
John D. Lewis.....	Samarang	New York	11,700	
Thornett & Fehr.....	Soerabaya	New York	114,660	
The Fisk Rubber Co.....	Singapore	Chicopee Falls	49,845	
L. Littlejohn & Co., Inc..	Singapore	New York	45,100	1,666,260
MAY 21. By the S. S. "City of Oran" at New York.				
Baird Rubber & Trading Co.	Colombo	New York	29,700	
Baring Brothers	Colombo	New York	58,140	
F. R. Henderson & Co...	Colombo	New York	12,960	
L. Littlejohn & Co., Inc..	Colombo	New York	107,360	
Various	Colombo	New York	193,360	
The Fisk Rubber Co.....	Singapore	Chicopee Falls	56,000	457,520
MAY 21. By the S. S. "Ryndam" at New York.				
H. A. Astlett & Co.....	Rotterdam	New York	25,000	
Various	Rotterdam	New York	73,320	
L. Littlejohn & Co., Inc..	Java	New York	89,600	187,920
MAY 28. By the S. S. "Niew Amsterdam" at New York.				
Meyer & Brown, Inc.....	Rotterdam	New York	44,800	44,800
MAY 28. By the S. S. "Koranna" at New York.				
H. A. Astlett & Co.....	Colombo	New York	180,000	
Baring Brothers	Colombo	New York	327,600	
Poel & Kelly.....	Colombo	New York	6,840	
Chas. T. Wilson Co., Inc.	Colombo	New York	50,400	
L. Littlejohn & Co., Inc..	Colombo	New York	257,600	
Meyer & Brown, Inc.....	Colombo	New York	336,000	
Various	Colombo	New York	184,290	1,342,730
MAY 28. By the S. S. "Amazon Maru" at New York.				
Baird Rubber & Trading Co.	Batavia	New York	134,640	
Baring Brothers.....	Batavia	New York	82,260	
Thornett & Fehr.....	Batavia	New York	274,320	
Poel & Kelly.....	Batavia	New York	363,780	
Eastern Rubber Co.....	Batavia	New York	50,400	
The Fisk Rubber Co.....	Singapore	Chicopee Falls	100,800	
L. Littlejohn & Co., Inc..	Singapore	New York	123,420	1,129,620
MAY 28. By the S. S. "Kentucky" at New York.				
Thornett & Fehr.....	Singapore	New York	458,820	
Meyer & Brown, Inc.....	Singapore	New York	170,840	
General Rubber Co.....	Singapore	New York	645,480	
McAllister Brothers.....	Singapore	New York	100,800	
Smith & Schippers, Inc..	Singapore	New York	81,000	
L. Littlejohn & Co., Inc..	Singapore	New York	481,600	
Baird Rubber & Trading Co.	Singapore	New York	22,400	
Goldman, Sachs & Co....	Singapore	New York	30,240	
Thomas A. Desmond & Co.	Singapore	New York	124,200	
F. R. Henderson & Co...	Singapore	New York	909,000	
William H. Stiles & Co..	Singapore	New York	56,000	
H. A. Astlett & Co.....	Singapore	New York	120,000	
Jaeger & Co.....	Singapore	New York	46,260	
Poel & Kelly.....	Singapore	New York	182,340	
Pennsylvania Rubber Co..	Singapore	Jeannette	412,560	
The Fisk Rubber Co.....	Singapore	Chicopee Falls	75,400	
Various	Singapore	New York	219,280	
General Rubber Co.....	Belawan-Deli	New York	42,480	
Various	Belawan-Deli	New York	46,620	4,225,320

	Shipment from:	Shipped to:	Pounds.	Totals.
MAY 30. By the S. S. "Laertes" at New York.				
W. R. Grace & Co.	Cochin	New York	9,000	
Various	Cochin	New York	34,020	
J. T. Johnstone & Co., Inc.	Penang	New York	54,000	
Various	Penang	New York	27,900	
Various	Belawan-Deli	New York	186,660	
Far East Importing Co., Inc.	Singapore	New York	14,400	
L. Littlejohn & Co., Inc.	Singapore	New York	403,200	
East Asiatic Co.	Singapore	New York	536,940	
Baring Brothers	Singapore	New York	244,800	
J. T. Johnstone & Co., Inc.	Singapore	New York	262,080	
Chas. T. Wilson Co., Inc.	Singapore	New York	181,620	
Continental Rubber Co., of New York	Singapore	New York	112,000	
Rubber Importers & Dealers Co., Inc.	Singapore	New York	229,860	
F. R. Henderson & Co.	Singapore	New York	52,560	
W. E. Byles	Singapore	New York	27,000	
William H. Stiles & Co.	Singapore	New York	89,600	
Baird Rubber & Trading Co.	Singapore	New York	11,200	
Meyer & Brown, Inc.	Singapore	New York	41,760	
General Rubber Co.	Singapore	New York	52,020	
Pell & Dumont, Inc.	Singapore	New York	36,000	
Firestone Tire & Rubber Co.	Singapore	Akron	181,620	
The Fisk Rubber Co.	Sipgapore	Chicopee Falls	44,795	
Meyer & Brown, Inc.	Singapore	New York	44,800	
Various	Singapore	New York	2,283,451	
Meyer & Brown, Inc.	Colombo	New York	190,400	
Hood Rubber Co.	London	Watertown	56,054	5,407,740
MAY 31. By the S. S. "Lewis Luckenbach" at New York.				
Thornett & Febr.	Rotterdam	New York	173,340	
Baird Rubber & Trading Co.	London	New York	134,400	307,740
JUNE 1. By the S. S. "Mineric" at New York.				
L. Littlejohn & Co., Inc.	Colombo	New York	44,800	
Baird Rubber & Trading Co.	Colombo	New York	89,600	134,400
JUNE 1. By the S. S. "Mineric" at Boston.				
Hood Rubber Co.	Colombo	Watertown	43,000	43,000
JUNE 3. By the S. S. "Invincible" at New York.				
L. Littlejohn & Co., Inc.	London	New York	316,275	
Hood Rubber Co.	London	Watertown	134,169	
Baird Rubber & Trading Co.	London	New York	84,000	
A. C. Spencer Hess.	Rotterdam	New York	98,817	
Various	Rotterdam	New York	47,544	680,805
JUNE 3. By the S. S. "Akita Maru" at New York.				
Various	Soerabaya	New York	485,800	
L. Littlejohn & Co., Inc.	Singapore	New York	204,620	
H. A. Astlett & Co.	Singapore	New York	60,000	750,420
JUNE 3. By the S. S. "Virgilia" at New York.				
L. Littlejohn & Co., Inc.	London	New York	44,800	44,800
JUNE 4. By the S. S. "Bessie Dollar" at New York.				
William H. Stiles & Co.	Singapore	New York	47,600	
Meyer & Brown, Inc.	Singapore	New York	112,000	
L. Littlejohn & Co., Inc.	Singapore	New York	147,225	
H. A. Astlett & Co.	Singapore	New York	56,000	
Various	Singapore	New York	585,775	948,600
JUNE 4. By the S. S. "Deer Lodge" at New York.				
Netherlands Corporation for oversea Trade	Soerabaya	New York	610,238	
Mitsui & Co., Limited.	Soerabaya	New York	13,158	
F. R. Henderson & Co.	Soerabaya	New York	165,294	
Various	Soerabaya	New York	60,375	
J. T. Johnstone & Co., Inc.	Penang	New York	67,200	
F. R. Henderson & Co.	Penang	New York	89,600	
Firestone Tire & Rubber Co.	Penang	Akron	208,214	
Mitsui & Co., Limited.	Batavia	New York	12,465	
Various	Batavia	New York	10,672	
J. T. Johnstone & Co., Inc.	Singapore	New York	75,390	
John D. Lewis	Singapore	New York	90,400	
F. R. Henderson & Co.	Singapore	New York	625,966	
L. Littlejohn & Co., Inc.	Singapore	New York	560,000	
William H. Stiles & Co.	Singapore	New York	145,600	
Poel & Kelly	Singapore	New York	420,969	
Pacific Trading Co.	Singapore	New York	11,200	
Various	Singapore	New York	184,690	3,351,431
JUNE 5. By the S. S. "Noordam" at New York.				
L. Littlejohn & Co., Inc.	Java	New York	22,766	
Meyer & Brown, Inc.	Rotterdam	New York	67,200	89,966
JUNE 6. By the S. S. "West Amargosa" at New York.				
East Asiatic Co., Inc.	Soerabaya	New York	374,334	
Firestone Tire & Rubber Co.	Belawan-Deli	Akron	47,160	
Lewis & Peat	Belawan-Deli	New York	101,520	
Chas. T. Wilson Co., Inc.	Belawan-Deli	New York	59,760	
John D. Lewis	Singapore	New York	120,960	
Poel & Kelly	Singapore	New York	324,180	
Various	Singapore	New York	134,820	1,162,734
JUNE 9. By the S. S. "Neuleus" at New York.				
Various	Soerabaya	New York	28,080	
L. Littlejohn & Co., Inc.	Batavia	New York	115,380	
Various	Batavia	New York	27,360	170,820
JUNE 9. By the S. S. "Eastern Merchant" at New York.				
Chas. T. Wilson Co., Inc.	Colombo	New York	20,160	
Firestone Tire & Rubber Co.	Singapore	Akron	195,480	215,640

	Shipment from:	Shipped to:	Pounds.	Totals.
JUNE 10. By the S. S. "Tulsa" at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	56,017	
Various	Rotterdam	New York	103,463	159,480
JUNE 10. By the S. S. "Yaka" at New York.				
East Asiatic Co., Inc.	Rotterdam	New York	52,200	52,200
JUNE 17. By the S. S. "Verentia" at New York.				
Various	London	New York	28,440	28,440
JUNE 18. By the S. S. "Rotterdam" at New York.				
Various	Rotterdam	New York	240,660	240,660
JUNE 18. By the S. S. "Grace Dollar" at New York.				
Fred Stern & Co.	Singapore	New York	50,400	
L. Littlejohn & Co., Inc.	Singapore	New York	39,600	
W. G. Ryckman, Inc.	Singapore	New York	189,000	
Firestone Tire & Rubber Co.	Singapore	Akron	105,660	
Poel & Kelly	Singapore	New York	70,920	
Pacific Trading Corporation of America	Singapore	New York	81,000	
William H. Stiles & Co.	Singapore	New York	33,600	
Various	Singapore	New York	77,820	
Various	Penang	New York	42,480	
Chas. T. Wilson Co., Inc.	Colombo	New York	72,720	
American Trading Co.	Colombo	New York	22,500	
Baird Rubber & Trading Co.	Colombo	New York	78,400	
H. A. Astlett & Co.	Colombo	New York	77,580	
L. Littlejohn & Co., Inc.	Colombo	New York	391,320	
H. Muehlstein & Co.	Colombo	New York	22,500	
Thomas A. Desmond & Co.	Colombo	New York	78,300	
Whittall & Co. of Ceylon	Colombo	New York	67,860	
Various	Colombo	New York	32,660	1,534,320
JUNE 19. By the S. S. "Salabangka" at New York.				
L. Littlejohn & Co., Inc.	Soerabaya	New York	322,020	
Stein, Hall & Co., Inc.	Soerabaya	New York	30,780	
Various	Soerabaya	New York	106,740	
L. Littlejohn & Co., Inc.	Batavia	New York	10,440	
Huth & Co.	Batavia	New York	27,720	
Various	Batavia	New York	36,540	
General Rubber Co.	Belawan-Deli	New York	204,120	
Various	Belawan-Deli	New York	300,480	
General Rubber Co.	Belawan	New York	1,024,560	
William H. Stiles & Co.	Singapore	New York	33,600	2,097,000
JUNE 20. By the S. S. "Kandahar" at New York.				
Meyer & Brown, Inc.	Singapore	New York	622,720	622,720
JUNE 17. By the S. S. "Kandahar" at Boston.				
Hood Rubber Co.	Singapore	Watertown	78,400	78,400
JUNE 20. By the S. S. "Clan MacInnes" at Boston.				
Hood Rubber Co.	Colombo	Watertown	80,200	80,200
CENTRALS				
MAY 26. By the S. S. "Sixaola" at New York.				
J. H. Thompson	Puerto Colombo	New York	540	540
JUNE 4. By the S. S. "Quilpue" at New York.				
Balfour Williamson & Co.	Guayaquil	New York	38,100	
W. R. Grace & Co.	Guayaquil	New York	20,100	
Ultramares Corporation	Guayaquil	New York	12,300	70,500
PONTIANAK				
MAY 28. By the S. S. "Kentucky" at New York.				
Various	Singapore	New York	198,900	198,900
MAY 30. By the S. S. "Laertes" at New York.				
Various	Singapore	New York	204,900	204,900
JUNE 18. By the S. S. "Grace Dollar" at New York.				
Arthur W. Stedman, Inc.	Singapore	New York	300	300
GUTTA PERCHA				
JUNE 4. By the S. S. "Deer Lodge" at New York.				
Various	Singapore	New York	45,300	45,300
GUAYULE				
MAY 31. By the S. S. "El Oriente" at New York.				
Continental Rubber Co. of New York	Torreon	New York	75,000	75,000
BALATA				
MAY 23. By the S. S. "Hebe" at New York.				
Wm. Schall & Co.	Paramaribo	New York	1,050	1,050
MAY 23. By the S. S. "Maraval" at New York.				
G. Amsinck & Co., Inc.	Trinidad	New York	12,765	12,765
MAY 24. By the S. S. "Elmac" at New York.				
Wm. Schall & Co.	Paramaribo	New York	7,350	
Middleton & Co., Limited.	Surinam	New York	20,548	27,898
MAY 26. By the S. S. "Sarpfos" at New York.				
G. Amsinck & Co., Inc.	Cartegena	New York	4,050	4,050
MAY 27. By the S. S. "Caronia" at New York.				
Earle Brothers	Liverpool	New York	900	900
MAY 31. By the S. S. "Michigan" at New York.				
Earle Brothers	London	New York	23,000	23,000
JUNE 3. By the S. S. "Invincible" at New York.				
Earle Brothers	Rotterdam	New York	2,974	2,974
JUNE 4. By the S. S. "Matura" at New York.				
G. Amsinck & Co., Inc.	Trinidad	New York	10,120	
Ultramares Corporation	Trinidad	New York	7,935	18,055
JUNE 11. By the S. S. "Carrillo" at New York.				
Rinehardt & Co.	Santa Marta	New York	450	450
JUNE 14. By the S. S. "Denis" at New York.				
General Rubber Co.	Manáos	New York	286	
Various	Manáos	New York	2,002	2,288
JUNE 16. By the S. S. "Parima" at New York.				
Ultramares Corporation	Trinidad	New York	20,470	20,470

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF MARCH, 1921

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Soles and Heels Value	Automobile Tires: Casings Value	Automobile Tires: Inner Tubes Value	Automobile Tires: Solid Tires Value	Automobile Tires: All Others Value	Insulated Wire and Cables Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value
EUROPE:																
Azores and Madeira Islands	.....	.....	.....	.....	.....	42	$38	$26	.....	.....	.....	.....	.....	.....	.....	$64
Belgium	.....	$2,875	$2,593	.....	.....	.....	.....	32	.....	$150	.....	$108	$60	$72	$3,479	9,369
Czechoslovakia	.....	.....	58	.....	.....	.....	.....	.....	$1,425	.....	.....	.....	.....	.....	.....	1,483
Denmark	.....	.....	440	.....	.....	7,917	9,890	.....	7,223	.....	.....	935	412	470	1,186	20,556
Finland	$96	.....	199	.....	.....	.....	.....	.....	490	125	.....	.....	66	.....	495	1,471
France	1,525	1,230	2,360	.....	.....	318	340	.....	440	.....	.....	.....	11,804	13,133	16,818	47,650
Germany	.....	.....	.....	.....	.....	.....	.....	15	.....	.....	.....	.....	1,286	.....	825	2,126
Greece	.....	.....	.....	.....	.....	.....	.....	.....	1,012	268	.....	.....	50	.....	.....	1,330
Iceland and Faroe Islands	.....	.....	.....	756	$2,723	2,544	2,364	694	1,045	61	.....	.....	.....	.....	9	6,896
Italy	.....	99	.....	2	10	.....	.....	.....	2,393	155	.....	.....	635	.....	721	4,013
Malta, Gozo and Cyprus Islands	.....	.....	.....	.....	.....	.....	.....	.....	1,858	.....	.....	.....	.....	.....	.....	1,858
Netherlands	.....	2,761	115	.....	.....	.....	.....	.....	8,060	2,104	916	2,300	.....	787	1,287	18,330
Norway	857	891	.....	.....	.....	18,546	15,978	.....	24,572	1,935	3,249	.....	1,223	802	3,083	52,590
Poland and Danzig	.....	.....	.....	.....	.....	.....	.....	.....	2,725	.....	.....	5,500	10,118	621	.....	18,964
Portugal	.....	13	.....	403	1,861	.....	.....	.....	.....	.....	.....	.....	.....	23	18	1,915
Roumania	.....	26	306	.....	.....	.....	.....	.....	495	54	.....	.....	.....	325	485	1,691
Russia in Europe	.....	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50
Spain	.....	90	.....	6	25	.....	.....	1,335	175	27	1,475	120	22,500	.....	6,732	32,479
Sweden	926	98	.....	190	500	.....	.....	.....	54,974	5,037	.....	.....	130,606	.....	1,403	193,544
Switzerland	702	53	.....	.....	.....	378	295	.....	1,788	279	.....	.....	5,097	.....	28	8,242
Turkey in Europe	.....	.....	.....	.....	.....	.....	.....	.....	6,236	1,736	.....	.....	.....	.....	.....	7,972
England	1,290	36,314	5,044	780	2,384	16,440	13,074	2,383	77,757	6,594	4,580	8	18,729	13,525	46,946	228,628
Scotland	.....	825	.....	.....	.....	23,249	23,257	.....	40	.....	.....	.....	.....	617	18	24,757
Ireland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32	51	1,662	1,745
Yugoslavia, Albania, etc	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	493	.....	.....	.....	.....	493
TOTALS, EUROPE	$5,396	$45,325	$11,115	2,137	$7,503	69,434	$65,236	$4,485	$192,708	$18,525	$10,713	$8,971	$202,618	$30,426	$85,195	$688,216
NORTH AMERICA:																
Bermuda	.....	$150	$52	21	$66	811	$1,219	$278	.....	.....	.....	$530	$219	$219	$171	$2,904
British Honduras	.....	7	1	.....	.....	720	1,086	65	$231	$31	.....	.....	47	9	40	1,517
Canada	$8,426	10,745	4,529	2,551	9,606	5,904	6,713	145	77,487	39,181	$6,103	3,540	20,921	25,543	122,625	335,564
Costa Rica	.....	384	.....	.....	.....	.....	.....	445	432	15	.....	210	2,704	.....	64	4,254
Guatemala	.....	1,127	1,100	.....	.....	72	86	372	1,949	159	.....	.....	177	30	33	5,033
Honduras	1,795	851	158	.....	.....	474	702	4	922	84	.....	.....	785	67	163	5,531
Nicaragua	720	45	.....	.....	.....	312	573	400	1,014	157	.....	.....	300	272	115	3,596
Panama	109	4,007	181	12	41	3,867	4,453	1,039	6,530	1,009	589	6,330	5,238	247	7,275	37,048
Salvador	.....	150	.....	.....	.....	.....	.....	981	1,378	255	.....	50	1,228	.....	283	4,325
Mexico	16,324	44,682	29,073	28	137	42,625	50,856	8,560	64,465	7,687	2,209	4,123	44,540	5,157	28,379	306,192
Miquelon, Langley, etc	.....	.....	30	396	1,539	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,569
Newfoundland and Labrador	115	991	.....	1,083	3,670	676	767	484	313	24	24	.....	1,872	18	940	9,268
Barbados	.....	49	.....	.....	.....	12	15	.....	4,355	524	.....	209	273	.....	464	5,889
Jamaica	277	1,272	164	.....	.....	2,058	2,135	.....	688	352	555	8	99	113	40	5,703
Trinidad and Tobago	1,350	755	114	.....	.....	3,684	4,076	.....	2,928	99	1,675	317	2,597	10	1,466	15,387
Other Brit. West Ind	769	88	218	.....	.....	138	83	143	2,891	273	.....	61	307	176	70	5,079
Cuba	1,347	14,777	5,494	72	371	5,263	6,875	9,753	71,897	9,379	27,251	9,091	61,422	7,771	17,040	242,468
Virgin Islands of United States	443	1,406	108	.....	.....	974	1,672	252	1,700	184	.....	8	244	10	911	6,938
Dutch West Indies	.....	.....	.....	.....	.....	409	414	90	291	70	.....	.....	36	24	54	979
French West Indies	161	8	.....	.....	.....	.....	.....	.....	272	.....	.....	.....	.....	.....	.....	441
Haiti	.....	87	59	.....	.....	216	533	.....	1,153	20	.....	.....	.....	91	174	2,117
Dominican Republic	94	827	528	.....	.....	96	108	31	5,808	799	.....	133	2,134	462	766	11,690
TOTALS, NORTH AMERICA	$31,930	$82,408	$41,809	4,163	$15,430	68,311	$82,366	$23,042	$246,704	$60,302	$38,456	$24,610	$145,143	$40,219	$181.073	$1,013,492
OCEANIA:																
Australia	$1,815	$227	$4,071	.....	.....	.....	.....	.....	$2,578	$107	$323	$839	$1,265	$2,182	$6,935	$20,342
New Zealand	1,287	19	169	3,547	$14,445	435	$716	.....	32,974	555	1,538	.....	49,759	1,105	3,807	106,374
Other British Oceania	.....	.....	.....	.....	.....	3,287	5,190	.....	1,149	726	.....	1,150	.....	.....	164	8,379
French Oceania	.....	169	.....	.....	.....	662	1,130	.....	955	49	171	260	150	.....	16	2,900
Other Oceania	.....	.....	.....	.....	.....	.....	.....	.....	.....	75	.....	.....	121	15	.....	211
Philippine Islands	104	509	642	24	66	4,878	6,746	$5,204	20,306	1,375	13,601	1,940	15,520	1,530	23,011	90,554
TOTALS, OCEANIA:	$3,206	$924	$4,882	3,571	$14,511	9,262	$13,782	$5,204	$57,962	$2,887	$15,633	$4,189	$66,815	$4,832	$33,933	$228,760
SOUTH AMERICA:																
Argentina	$16,913	$4,338	$1,075	468	$2,117	720	$815	$186	$89,911	$10,869	$2,253	.....	$56,990	$1,888	$19,814	$207,169
Bolivia	1,287	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	72	18	76	1,453
Brazil	3,264	5,371	149	.....	.....	4,435	4,586	151	10,352	57	236	$840	102,713	2,183	7,210	137,112
Chile	4,663	2,670	807	100	700	172	188	300	3,533	342	400	102	9,556	479	2,217	25,957
Colombia	4,389	.....	464	.....	.....	.....	.....	.....	2,920	315	.....	5	2,823	553	113	11,582
Ecuador	.....	103	624	.....	.....	.....	.....	.....	497	62	.....	.....	377	.....	.....	1,663
British Guiana	.....	18	80	.....	.....	69	136	.....	922	168	104	.....	560	.....	112	2,100
Dutch Guiana	.....	.....	.....	.....	.....	.....	.....	.....	511	.....	.....	.....	47	.....	.....	558
French Guiana	.....	60	.....	.....	.....	.....	.....	.....	75	43	.....	.....	1,144	.....	.....	1,322
Peru	263	3,136	100	1	5	.....	.....	869	4,360	1,737	1,157	100	12,070	378	1,394	24,700
Uruguay	.....	321	.....	.....	.....	.....	.....	.....	4,637	.....	.....	1,850	2,690	148	5,378	15,893
Venezuela	50	20	457	.....	.....	96	146	216	9,385	815	950	.....	690	437	1,455	14,621
TOTALS, SOUTH AMERICA	$30,829	$16,037	$3,756	569	$2,822	5,492	$5,871	$1,722	$127,103	$14,408	$5,100	$2,897	$189,732	$6,084	$37,769	$444,130

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Soles and Heels Value	Automobile Tires Casings Value	Automobile Tires Inner Tubes Value	Automobile Tires Solid Tires Value	Automobile Tires All Others Value	Insulated Wire and Cables Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value
ASIA:																
Aden	.....	.....	.....	.....	.....	.....	.....	.....	$81	$20	.....	.....	.....	.....	.....	$101
China	.....	$2,926	$518	48	$216	2,425	$3,663	.....	6,955	165	.....	.....	$86,417	$1,739	$7,265	108,804
Chosen	$523	.....	.....	.....	.....	.....	.....	.....	1,218	569	.....	.....	.....	.....	.....	3,001
British India	21,728	11,784	389	.....	.....	270	292	$134	32,256	112	$4,019	$5	13,591	1,486	4,412	90,208
Straits Settlements	.....	282	.....	.....	.....	72	70	.....	1,346	86	809	.....	.....	48	.....	2,641
Other British East Indies	.....	.....	.....	.....	.....	408	498	.....	185	.....	.....	.....	.....	.....	.....	683
Dutch East Indies	349	181	2,319	12	31	.....	.....	.....	52,967	270	800	.....	3,840	.....	67	60,824
Hongkong	.....	101	28	.....	.....	2,448	2,980	.....	1,704	193	.....	.....	206	231	481	5,924
Japan	125	.....	360	3,112	8,378	26,342	29,310	.....	10,114	98	2,226	.....	8,572	691	31,907	91,981
Persia	.....	.....	.....	.....	.....	1	2	.....	97	126	.....	.....	.....	.....	.....	225
Siam	.....	.....	.....	.....	.....	.....	.....	.....	171	.....	.....	.....	.....	.....	113	284
Turkey in Asia	.....	100	55	12	27	849	1,396	.....	242	171	.....	.....	.....	.....	.....	1,991
TOTALS, ASIA	$22,725	$15,374	$3,669	3,184	$8,652	32,815	$37,411	$134	$108,036	$1,741	$7,854	$5	$112,626	$4,195	$44,245	$366,667
AFRICA:																
Belgian Kongo	$39	.....	.....	.....	.....	1	$2	.....	$2,562	$883	.....	.....	.....	$23	.....	$41
British West Africa	.....	.....	.....	.....	.....	1	2	.....	2,562	883	.....	.....	.....	23	.....	3,470
British South Africa	6,056	$25,014	$1,379	160	$982	183	244	$1,599	10,434	.....	.....	.....	$4,468	1,365	$13,256	64,797
British East Africa	.....	.....	.....	.....	.....	.....	.....	.....	788	.....	.....	.....	245	.....	114	1,147
Canary Islands	3,993	.....	.....	.....	.....	.....	.....	.....	1,164	74	.....	.....	.....	.....	29	1,267
French Africa	.....	.....	.....	.....	.....	.....	.....	.....	144	.....	$1,568	.....	.....	.....	2	5,707
Liberia	.....	.....	.....	.....	.....	.....	.....	.....	16	145	.....	.....	.....	.....	.....	161
Morocco	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70	70
Portuguese Africa	.....	4,893	85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17	1,790	6,785
Egypt	.....	.....	.....	.....	.....	.....	.....	.....	1,989	398	.....	$300	.....	.....	.....	2,687
TOTALS, AFRICA	$10,088	$29,907	$1,464	160	$982	185	$248	$1,599	$17,097	$1,500	$1,568	$300	$4,713	$1,405	$15,261	$86,132
GRAND TOTALS	$104,174	$189,975	$66,695	13,784	$49,900	185,499	$204,914	$36,186	$749,610	$99,363	$79,324	$40,972	$721,647	$87,161	$397,476	$2,827,397

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORY OF UNITED STATES

	Belting, Hose and Packing Value	Boots and Shoes Pairs	Boots and Shoes Value	Tires Automobile Value	Tires All Others Value	Insulated Wire and Cables Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value
Hawaii	$9,165	.....	.....	$108,021	$658	.....	.....	$21,256	$139,100
Porto Rico	5,601	.....	.....	52,124	4,364	.....	.....	10,247	72,336
TOTALS	$14,766	.....	.....	$160,145	$5,022	.....	.....	$31,503	$211,436

Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	March 1920 Pounds	March 1920 Value	March 1921 Pounds	March 1921 Value
UNMANUFACTURED—*free:*				
India rubber:				
From France	681,507	$216,758	.....	.....
Netherlands	508,979	234,584	282,125	$63,225
Portugal	590,983	153,832	1,022,225	107,547
United Kingdom	12,132,921	5,430,923	2,495,490	420,552
Canada	10	4	.....	.....
Central America	33,633	8,690	3,895	207
Mexico	50,918	20,731	.....	.....
Brazil	5,195,613	1,586,260	2,265,853	283,133
Peru	.....	.....	4,638	974
Other South Am.	112,781	36,202	84,861	34,561
British E. Indies	50,543,518	24,079,584	17,106,287	4,619,839
Dutch E. Indies	11,230,835	4,934,512	5,243,621	1,333,270
Other countries	1,395,909	681,081	.....	.....
Totals	82,477,607	$37,383,161	28,508,995	$6,863,308
Balata	61,035	$32,289	46,216	$28,042
Guayule	256,300	59,820	.....	.....
Jelutong (Pontianak)	1,053,230	164,519	228,424	29,722
Gutta percha	630,394	106,495	140,690	25,227
Rubber scrap	1,554,686	104,357	181,799	15,217
Totals, unmanufactured	86,033,252	$37,850,641	29,106,124	$6,961,516
Chicle ..... *dutiable*	1,123,964	$863,822	654,149	$366,449
India rubber and gutta percha ..... *dutiable*	.....	107,543	.....	76,612

EXPORTS OF DOMESTIC MERCHANDISE

MANUFACTURED—				
India rubber:				
Scrap and old	1,418,288	$89,108	371,646	$17,997
Reclaimed	608,702	98,729	37,340	5,609
Belting[1]	.....	277,576	.....	104,174
Hose[1]	.....	235,832	.....	189,975
Packing[1]	.....	128,940	.....	66,695
Boots[1] ..... *pairs*	37,487	111,438	13,784	49,900
Shoes[1] ..... *pairs*	1,175,958	1,009,218	185,499	204,914
Soles and heels[1]	.....	71,897	.....	36,186
Tires:				
Casings[1]	.....	4,220,956	.....	749,610
Inner tubes[1]	.....	565,578	.....	99,363
Solid tires[1]	.....	479,148	.....	79,324
All other tires[1]	.....	181,101	.....	40,972
Druggists' rubber sundries[1]	.....	178,402	.....	87,161
Suspenders and garters	.....	323,881	.....	61,208
Other rubber manufactures[1]	.....	729,766	.....	397,476
Totals, manufactured	.....	$8,701,570	.....	$2,190,564
Fountain pens ..... *number*	26,411	$31,346	20,879	$21,951
Insulated wire and cables	.....	543,546	.....	721,647

EXPORTS OF FOREIGN MERCHANDISE

UNMANUFACTURED—				
India rubber	554,505	$231,013	623,851	$114,124
Balata	83,390	46,976	55,711	20,657
Jelutong (Pontianak)	28,750	5,562	46,436	9,133
Rubber scrap	49,693	9,690	.....	.....
Totals, unmanufactured	716,338	$293,241	725,998	$143,914
MANUFACTURED—				
Gutta percha and india rubber	.....	$1,527	.....	$4,194
India rubber substitutes	3,059	1,407	.....	.....
Totals, manufactured	.....	$2,934	.....	$4,194
Chicle	41,498	$21,299	.....	.....

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES

MANUFACTURED—				
To Alaska:				
Belting, hose and packing	.....	$12,542	.....	$3,915
Boots and shoes ..... *pairs*	2,059	30,813	2,517	7,356
Other rubber goods	.....	4,266	.....	2,859
Totals	.....	$47,621	.....	$14,130
To Hawaii:				
Belting, hose and packing	.....	$24,385	.....	$9,165
Automobile tires	.....	123,133	.....	108,021
Other tires	.....	22,986	.....	658
Other rubber goods	.....	20,512	.....	21,256
Totals	.....	$191,016	.....	$139,100
To Porto Rico:				
Belting, hose and packing	.....	$3,626	.....	$5,601
Automobile tires	.....	41,484	.....	52,124
Other tires	.....	7,716	.....	4,364
Other rubber goods	.....	8,641	.....	10,247
Totals	.....	$61,467	.....	$72,336

[1]Details of exports of domestic merchandise by countries during March, 1921, appear in this issue.

UNITED STATES CRUDE RUBBER IMPORTS FOR 1921 (BY MONTHS)

1921	Plantations	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Balata	Miscellaneous	Waste	Totals 1921	Totals 1920
January ..... *tons*	12,819	1,312	43	3	....	....	41	173	1,071	15,462	22,401
February	7,913	432	269	2	25	....	25	216	37	8,919	33,984
March	12,241	1,794	377	1	....	3	29	7	345	14,797	33,998
April	16,861	403	....	5	....	....	64	226	7	17,566	24,957
May	9,127	1,570	....	2	33	....	40	186	41	10,999	28,666
Totals, 5 months, 1921...	58,961	5,511	689	13	58	3	199	808	1,501	67,743	.....
Totals, 5 months, 1920...	121,492	11,457	3,183	523	340	13	312	4,102	2,584	.....	144,006

Compiled by The Rubber Association of America, Inc.

CUSTOM HOUSE STATISTICS

NEW YORK

IMPORTS

	April 1920 Pounds	April 1920 Value	April 1921 Pounds	April 1921 Value
UNMANUFACTURED—*free:*				
Crude rubber:				
From Belgium	116,819	$58,175	.....	.....
France	864,073	251,239	.....	.....
Netherlands	133,674	54,892	622,022	$103,804
Portugal	14,100	9,869	.....	.....
England	8,712,078	4,186,309	3,374,461	524,827
Costa Rica	445	153	.....	.....
Nicaragua	6,218	1,713	4,080	408
Panama	7,264	1,573	2,601	910
Mexico	7,139	2,185	.....	.....
Trinidad	1,135	478	.....	.....
Brazil	5,183,214	1,499,276	1,611,408	177,074
Colombia	38,837	10,445	50,000	13,860
Ecuador	56,009	12,776	.....	.....
Peru	789,052	246,707	8,377	875
Uruguay	18,159	4,653	22,357	5,578
British India	435,912	215,660	306,960	59,673
Straits Settlements	32,605,537	15,971,292	12,524,541	3,036,180
British East Indies	4,240,785	1,908,405	4,285,845	712,404
Dutch East Indies	7,647,262	3,623,383	2,138,724	579,517
Japan	67,300	33,409	.....	.....
Philippine Islands	13,096	5,896	.....	.....
British West Africa	92,572	41,109	.....	.....
British South Africa	13,871	5,548	.....	.....
Portuguese Africa	962	230	.....	.....
Bolivia	.....	.....	148,200	16,552
Totals	60,965,513	$28,145,375	25,099,576	$5,231,662
Balata	79,073	47,037	157,667	95,491
Jelutong (Pontianak)	1,720,819	298,528	140,789	25,197
Gutta percha	692,234	152,997	14,474	1,489
Totals	63,457,639	$28,643,937	25,412,506	$5,353,839
Rubber scrap and reclaimed	1,308,534	84,376	96,700	4,968
Totals, unmanufactured	64,766,173	$28,728,313	25,509,206	$5,358,807
Manufacturers of rubber and gutta percha	.....	$42,000	.....	$70,418
Rubber substitutes	8,946	1,539	.....	.....
Chicle ..... *dutiable*	368,192	272,889	90,186	39,007

EXPORTS

MANUFACTURED:				
Automobile and other tires	.....	$2,508,721	.....	$527,804
Inner tubes	.....	273,426	.....	47,552
Belting, hose, and packing	.....	293,854	.....	179,164
Rubber boots and shoes, *pairs*	378,082	373,658	68,513	90,983
Soles and heels	.....	78,531	.....	23,091
Druggists' sundries	.....	72,088	.....	45,565
Other rubber manufactures	.....	460,651	.....	201,288
Totals, manufactured	.....	$4,060,929	.....	$1,115,447
Insulated wire	.....	$437,331	.....	$750,882
UNMANUFACTURED—*free:*				
Rubber scrap and reclaimed	111,254	$14,524	335,573	$21,240

FOREIGN EXPORTS

Crude rubber	.....	.....	647,444	$127,112
Balata	.....	.....	35,680	18,735
Rubber scrap and reclaimed	.....	.....	25,293	2,529
Rubber manufactures	.....	.....	.....	691
Chicle	.....	.....	943	366

MASSACHUSETTS

IMPORTS

UNMANUFACTURED—*free:*				
Crude rubber:				
From England	88,836	$46,872	.....	.....
Straits Settlements	.....	.....	11,200	$1,758
British East Indies	.....	.....	365,720	42,452
Totals	88,836	$46,872	376,920	$44,210
Gutta percha	111,957	17,353	.....	.....
Rubber scrap and reclaimed	104,234	5,681	.....	.....
Totals, unmanufactured	305,027	$69,906	376,920	$44,210
Rubber manufactures—*dutiable*	.....	$18,011	.....	$4,796

EXPORTS

	April 1920 Pounds	April 1920 Value	April 1921 Pounds	April 1921 Value
MANUFACTURED:				
Automobile and other tires	.....	$4,584	.....	$11,944
Inner tubes	.....	2,301	.....	548
Belting, hose and packing	.....	8,382	.....	2,391
Rubber boots and shoes—*pairs*	310,277	283,887	13,197	15,022
Soles and heels	.....	2,976	.....	503
Druggists' sundries	.....	10,361	.....	2,926
Other rubber manufactures	.....	57,154	.....	42,724
Totals, manufactured	.....	$369,645	.....	$76,058
Insulated wire	.....	$30,737	.....	$798
Rubber scrap and reclaimed	50,812	4,573	.....	.....

BUFFALO

IMPORTS

UNMANUFACTURED—*free:*				
Rubber scrap and reclaimed	329,651	$14,274	2,321	$66
Rubber manufactures *dutiable*	.....	134	.....	435
Chicle ..... *dutiable*	8	6	.....	.....

EXPORTS

MANUFACTURED:				
Automobile and other tires	.....	$114,021	.....	$22,532
Inner tubes	.....	2,851	.....	1,930
Belting, hose, and packing	.....	28,913	.....	10,824
Rubber boots and shoes, *pairs*	77	95	1	4
Soles and heels	.....	1,093	.....	129
Druggists' sundries	.....	10,102	.....	7,659
Other rubber manufactures	.....	65,573	.....	97,750
Totals, manufactured	.....	$222,648	.....	$140,828
Insulated wire	.....	$5,084	.....	$11,114
Rubber scrap and reclaimed	210,540	31,964	18,013	1,893

FOREIGN EXPORTS

Crude rubber	77,819	$37,978	574,487	$90,154
Chicle	548	156	.....	.....
Rubber manufactures	.....	39	.....	834

PHILADELPHIA

IMPORTS

Rubber manufactures *dutiable*	.....	$198	.....	$167

EXPORTS

MANUFACTURED:				
Automobile and other tires	.....	$31,962	.....	.....
Inner tubes	.....	152	.....	.....
Belting, hose, and packing	.....	23,095	.....	5,784
Soles and heels	.....	1,773	.....	.....
Druggists' sundries	.....	439	.....	.....
Other rubber manufactures	.....	14,911	.....	114
Totals, manufactured	.....	$72,332	.....	$5,898
Insulated wire	.....	$14,581	.....	$82
Rubber scrap and reclaimed	11,529	1,350	30,919	2,000

NEW ORLEANS

IMPORTS

UNMANUFACTURED—*free:*				
Crude rubber:				
From Nicaragua	2,535	$416	.....	.....
Totals, unmanufactured	2,535	$416	.....	.....
Chicle ..... *dutiable*	997	$659	192	$95

EXPORTS

MANUFACTURED:				
Automobile and other tires	.....	$38,739	.....	$3,121
Inner tubes	.....	11,084	.....	438
Belting, hose, and packing	.....	37,754	.....	11,079
Rubber boots and shoes, *pairs*	13,565	15,265	3,989	7,869
Soles and heels	.....	6,486	.....	183
Druggists' sundries	.....	23	.....	825
Other rubber manufactures	.....	2,151	.....	376
Totals, manufactured	.....	$111,502	.....	$23,891
Insulated wire	.....	.....	.....	$2,194

OHIO

IMPORTS

Rubber scrap and reclaimed	.....	.....	18,376	$2,134

SAN FRANCISCO

IMPORTS

	April 1920 Pounds	April 1920 Value	April 1921 Pounds	April 1921 Value
UNMANUFACTURED—*free*:				
Crude rubber:				
From Straits Settlements	1,002,681	$522,138	22,570	$4,514
Dutch East Indies	341,442	110,033	39,816	7,168
Hongkong	600	200	.....	.....
Colombia	.....	.....	4,300	969
Totals, unmanufactured	1,344,723	$632,371	66,686	$12,651
Rubber manufactures, *dutiable*	.....	$19	.....	.....

EXPORTS

MANUFACTURED:				
Automobile and other tires	.....	$381,275	.....	$45,216
Inner tubes	.....	32,554	.....	1,041
Belting, hose, and packing	.....	67,372	.....	26,682
Rubber boots and shoes, *pairs*	6,670	10,979	2,992	3,430
Soles and heels	.....	13,469	.....	807
Druggists' sundries	.....	4,164	.....	2,285
Other rubber manufactures	.....	21,048	.....	4,384
Totals, manufactured	.....	$530,861	.....	$83,845
Insulted wire	.....	$5,664	.....	$4,383
Rubber scrap and reclaimed	238,112	12,192	50,000	1,125

FOREIGN EXPORTS

Crude rubber	298	$63	.....	.....
Chicle	43,367	44,196	.....	.....
Rubber manufactures	.....	1	.....	.....

WASHINGTON

IMPORTS

UNMANUFACTURED—*free*:				
Crude rubber:				
From Canada	.....	.....	18,000	$1,800
Dutch East Indies	.....	.....	54,323	10,159
Totals	.....	.....	72,323	$11,959
Rubber scrap and reclaimed	.....	.....	3,770	66
Totals, unmanufactured	.....	.....	76,093	$12,025

EXPORTS

MANUFACTURED:				
Automobile and other tires	.....	$20,115	.....	$3,975
Inner tubes	.....	2,229	.....	34
Belting, hose, and packing	.....	1,668	.....	591
Rubber boots and shoes, *pairs*	292	614	1,488	2,528
Druggists' sundries	.....	1,938	.....	459
Other rubber manufactures	.....	1,674	.....	3,267
Totals, manufactured	.....	$28,238	.....	$10,854
Insulated wire	.....	$9	.....	.....
Rubber scrap and reclaimed	$90,695	3,967	127,353	$2,736

CHICAGO

IMPORTS

Rubber manufactures, *dutiable*	.....	$9,560	.....	$10,345
Chicle, *dutiable*	61,413	38,668	638,329	322,453

MICHIGAN

IMPORTS

Rubber scrap and reclaimed	.....	.....	25,570	$1,544
Rubber manufactures, *dutiable*	.....	$31	.....	645

EXPORTS

MANUFACTURED:				
Automobile and other tires	.....	$82,589	.....	$4,673
Inner tubes	.....	9,166	.....	26
Belting, hose, and packing	.....	3,684	.....	2,469
Rubber boots and shoes, *pairs*	3,924	13,630	4,253	13,997
Soles and heels	.....	567	.....	.....
Druggists' sundries	.....	843	.....	1,171
Other rubber manufactures	.....	16,454	.....	8,996
Totals, manufactured	.....	$126,933	.....	$31,332
Insulated wire	.....	$3,252	.....	$2,552
Rubber scrap and reclaimed	58,258	4,492	41,543	539

IMPORTS OF CRUDE RUBBER INTO THE UNITED STATES BY CUSTOMS DISTRICTS

CUSTOMS DISTRICTS	May, 1921 Founds	May, 1921 Value
Massachusetts	241,020	$28,019
Buffalo	188,262	95,072
New York	23,275,087	3,901,444
Los Angeles	47,278	11,175
San Francisco	134,531	35,419
Washington	4,660	792
Totals	23,890,838	$4,071,921

UNITED KINGDOM RUBBER STATISTICS

IMPORTS

	April 1920 Pounds	April 1920 Value	April 1921 Pounds	April 1921 Value
UNMANUFACTURED—				
Crude rubber:				
From—				
Straits Settlements	5,218,700	£636,494	7,922,200	£395,451
Federated Malay States	6,996,600	848,448	7,275,800	404,318
British India	800,100	96,420	711,700	38,523
Ceylon and dependencies	3,431,500	415,713	3,210,800	164,446
Other Dutch possessions in Indian Seas	661,700	80,981	1,366,300	66,505
Dutch East Indies (except other Dutch possessions in Indian Seas)	1,753,100	210,055	1,997,000	112,983
Other countries in East Indies and Pacific, not elsewhere specified	173,500	20,982	254,700	13,026
Brazil	1,386,300	149,940	160,300	7,375
Peru	900	90	.....	.....
South and Central America (except Brazil and Peru)	5,700	672	15,100	597
West Africa:				
French West Africa	4,700	255	3,300	124
Gold Coast	17,100	1,937	7,600	382
Other parts of West Africa	357,100	25,074	59,600	2,821
East Africa including Madagascar	293,700	33,527	89,300	4,202
Other countries	146,500	11,701	87,000	4,167
Totals	21,247,200	£2,532,289	23,160,700	£1,214,920
Waste and reclaimed rubber	996,700	19,717	77,100	1,200
Totals, unmanufactured	22,243,900	£2,552,006	23,237,800	£1,216,120
Gutta percha and balata	502,500	£84,106	410,000	£76,306
Rubber substitutes	246,000	10,417	4,000	147
MANUFACTURED—				
Boots and shoes, *dozen pairs*	26,698	£68,689	12,639	£23,733
Waterproof clothing	.....	270	.....	667
Insulated wire	.....	5,180	.....	2,853
Tires and tubes	.....	501,394	.....	163,562
Other rubber manufacturers	.....	58,600	.....	49,232

EXPORTS

UNMANUFACTURED—				
Waste and reclaimed rubber	1,576,900	£41,959	190,200	£5,665
Rubber substitutes	257,000	12,686	47,000	1,371
Totals	1,833,900	£54,645	237,200	£7,036
MANUFACTURED—				
Boots and shoes, *dozen pairs*	6,719	£14,833	6,552	£15,263
Waterproof clothing	.....	267,648	.....	69,128
Insulated wire	.....	121,048	.....	162,914
Submarine cables	.....	88,278	.....	387,949
Tires and tubes	.....	552,196	.....	185,997
Other rubber manufactures	.....	369,818	.....	216,740

EXPORTS—COLONIAL AND FOREIGN

UNMANUFACTURED—				
Crude rubber:				
To Sweden, Norway and Denmark	199,900	£22,468	127,800	£7,074
Germany	1,193,700	142,204	1,799,800	74,992
Belgium	998,100	121,854	81,200	4,765
France	3,142,300	421,811	601,700	28,762
Spain	99,500	13,281	12,200	550
Italy	1,323,000	174,074	225,900	9,428
Austria-Hungary	.....	.....	148,200	6,757
Other European countries	57,700	5,940	98,300	3,395
United States	7,676,300	938,762	4,493,300	207,980
Canada	714,300	85,107	.....	.....
Other countries	203,100	26,419	3,300	247
Totals rubber	15,607,900	£1,951,920	7,591,700	£343,950
Waste and reclaimed rubber	8,300	£373	200	£14
Gutta percha and balata	216,200	34,275	27,200	5,462
Rubber substitutes	7,300	490	.....	.....
MANUFACTURED—				
Boots and shoes, *dozen pairs*	3	£26	285	£1,177
Waterproof clothing	.....	.....	.....	330
Insulated wire	.....	85	.....	.....
Tires and tubes	.....	32,411	.....	57,714
Other rubber manufactures	.....	1,914	.....	3,754
Totals, manufactured	.....	£34,436	.....	£62,975

RUBBER EXPORTS FROM PENANG

	January 1 to March 31, 1920	January 1 to March 31, 1921
To Great Britain, *piculs*[1]	69,247	49,749
Europe	742	425
United States	59,798	2,084
Totals, *piculs*[1]	129,787	52,258

[1]One picul equals 133⅓ pounds.

RUBBER STATISTICS FOR THE DOMINION OF CANADA

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	March 1920 Pounds	March 1920 Value	March 1921 Pounds	March 1921 Value
UNMANUFACTURED—*free:* Rubber, gutta percha, etc.:				
From United Kingdom	905,319	$581,613	55,266	$11,076
United States	516,817	192,995	741,715	131,844
Brazil	36,036	26,327	97,555	13,916
British East Indies:				
Ceylon	291,200	192,391	.....	.....
Straits Settlements	1,652,309	840,583	796,722	181,671
Dutch East Indies	114	57	.....	.....
Other countries	4,486	2,086	29,461	11,700
Total	3,406,281	$1,836,052	1,720,719	$350,207
Rubber, recovered	586,432	88,549	44,453	6,821
Rubber, powdered, and rubber or gutta percha scrap	101,502	11,420	61,318	3,328
Rubber substitutes	271,962	32,584	60,035	8,817
Totals, unmanufactured	4,366,177	$1,968,605	1,886,525	$369,173
PARTLY MANUFACTURED—				
Hard rubber sheets and rods	18,827	$14,688	21,086	$6,112
Hard rubber tubes	.....	2,835	.....	7,828
Rubber thread, not covered	6,227	8,998	1,679	2,251
Totals, partly manufactured	25,054	$26,521	22,765	$16,191
MANUFACTURED—				
Belting	.....	$15,836	.....	$18,416
Hose	.....	9,941	.....	10,013
Packing	.....	17,133	.....	5,814
Boots and shoes	.....	21,500	.....	12,233
Clothing, including waterproofed	.....	29,962	.....	23,302
Gloves	.....	1,195	.....	1,991
Hot water bottles	.....	3,799	.....	2,926
Tires, solid	.....	14,764	.....	11,165
Tires, pneumatic	.....	380,913	.....	132,070
Inner tubes	.....	47,720	.....	15,183
Elastic, round or flat	.....	73,665	.....	26,320
Mats and matting	.....	460	.....	543
Cement	.....	4,720	.....	5,271
Other rubber manufactures	.....	209,570	.....	155,517
Totals, manufactured	.....	$831,178	.....	$420,764
Totals, rubber imports	4,391,231	$2,826,304	1,909,290	$806,128
Insulated wire and cables: Wire and cables covered with cotton, linen, silk, rubber, etc.	.....	$11,301	.....	$10,041
Copper wire and cables, covered as above	.....	24,871	.....	14,813
Chicle	167,846	121,322	182,296	81,933
Fillets	.....	919	.....	595
Webbing	.....	72,634	.....	30,294
Fountain pens	.....	6,203	.....	3,263

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS

	March 1920 Produce of Canada Value	March 1920 Reexports of Foreign Goods Value	March 1921 Produce of Canada Value	March 1921 Reexports of Foreign Goods Value
UNMANUFACTURED—				
Crude and waste rubber	$37,092	.....	$4,976	.....
MANUFACTURED—				
Belting	$954	.....	$228	.....
Hose	16,778	.....	3,903	.....
Boots and shoes	146,814	$76	58,205	$6,672
Clothing, including waterproofed	5,132	.....	299	.....
Tires, pneumatic	974,026	.....	97,208	.....
Tires	10,799	3,677	9,571	484
Other manufactures	24,528	1,528	11,008	12,093
Totals, manufactured	$1,179,031	$5,281	$180,422	$19,249
Totals, rubber exports	$1,216,123	$5,281	$185,398	$19,249
Insulated wire and cable: Copper wire and cable	$4,282	.....	$15,669	.....
Chicle	72,243	.....	44,770	.....

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	Twelve Months Ended March 1920 Pounds	1920 Value	1921 Pounds	1921 Value
UNMANUFACTURED—*free:* Rubber, gutta percha, etc.:				
From United Kingdom	6,764,275	$3,626,381	4,734,734	$2,483,804
United States	6,383,440	2,904,973	7,558,101	1,984,587
Belgian Congo	72,071	27,536	63,821	52,662
Brazil	110,941	72,092	638,592	237,204
British East Indies:				
Ceylon	1,403,665	835,873	272,052	124,404
India	.....	.....	43,793	20,510
Straits Settlements	9,678,095	4,531,390	9,257,010	3,867,239
Dutch East Indies	342	171	22,129	10,933
Other countries	20,669	12,316	215,968	105,853
Totals	24,433,498	$12,010,732	22,806,200	$8,887,196
Balata	62	$91	104	$171
Rubber, recovered	3,782,439	597,553	2,523,590	433,456
Rubber, powdered, and rubber or gutta percha scrap	2,073,665	191,380	2,325,562	189,863
Rubber substitutes	1,503,689	176,034	1,508,872	213,396
Totals, unmanufactured	31,793,353	$12,975,790	29,164,328	$9,724,082
PARTLY MANUFACTURED—				
Hard rubber sheets and rods	240,612	$127,801	213,970	$128,734
Hard rubber tubes	.....	31,240	.....	51,075
Rubber thread, not covered	47,875	69,605	40,873	53,339
Totals, partly manufactured	288,487	$228,646	254,843	$233,148
MANUFACTURED—				
Belting	.....	$161,424	.....	$192,658
Hose	.....	112,955	.....	142,157
Packing	.....	94,140	.....	85,614
Boots and shoes	.....	287,617	.....	269,055
Clothing, including waterproofed	.....	238,180	.....	248,082
Gloves	.....	14,034	.....	17,248
Hot water bottles	.....	34,547	.....	29,529
Tires, solid	.....	191,424	.....	203,299
Tires, pneumatic	.....	1,655,118	.....	1,903,444
Inner tubes	.....	168,340	.....	204,198
Elastic, round or flat	.....	403,443	.....	485,867
Mats and matting	.....	4,275	.....	3,080
Cement	.....	84,593	.....	50,634
Other rubber manufactures	.....	1,404,909	.....	1,688,865
Totals, manufactured	.....	$4,854,999	.....	$5,523,730
Totals, rubber imports	32,081,840	$18,059,435	29,419,171	$15,480,960
Insulated wire and cables: Wire and cables covered with cotton, linen, silk, rubber, etc	.....	$167,199	.....	$206,607
Copper wire and cables, covered as above	.....	141,465	.....	302,336
Chicle	2,084,392	1,542,165	514,910	265,902
Fillets	.....	11,556	.....	4,567
Webbing	.....	541,389	.....	582,733
Fountain pens	.....	48,973	.....	50,536

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS

	Twelve Months Ended March 1920 Produce of Canada Value	1920 Reexports of Foreign Goods Value	1921 Produce of Canada Value	1921 Reexports of Foreign Goods Value
UNMANUFACTURED—				
Crude and waste rubber	$442,209	$161,204	$133,516	$1,751
MANUFACTURED—				
Belting	$24,455	.....	$83,869	.....
Hose	169,822	.....	225,435	.....
Boots and shoes	1,750,967	$3,132	1,524,969	$10,178
Clothing, including waterproofed	56,640	1,030	36,534	2,413
Tires, pneumatic	7,291,777	.....	8,191,511	.....
Tires	103,395	41,023	62,475	66,301
Other manufactures	230,698	34,673	581,219	49,487
Totals, manufactured	$9,627,754	$79,858	$10,706,012	$128,379
Totals, rubber exports	$10,069,963	$241,062	$10,839,528	$130,130
Insulated wire and cable: Copper wire and cable	$905,868	.....	$566,007	.....
Chicle	734,414	.....	197,416	.....

RUBBER STATISTICS FOR SCANDINAVIA

SWEDEN

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	December		Year Ended December	
	1919	1920	1919	1920
UNMANUFACTURED—				
Crude rubber.....*kilos*[1]	103,118	182,433	2,054,902	1,592,365
MANUFACTURED—				
Rubber footwear.....	85,600	7,162	132,831	100,970
Clothing and similar goods, coated or impregnated with rubber	23,565	9,210	176,353	450,997
All other rubber goods.....	186,599	118,306	1,961,707	3,407,250

EXPORTS OF CRUDE AND MANUFACTURED RUBBER

UNMANUFACTURED—				
Waste and old rubber.....*kilos*[1]	5,471	3,102	28,089	285,543
MANUFACTURED—				
Footwear	1,738	6,182	70,692	99,131

NORWAY

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	November		Eleven Months Ended November	
	1919	1920	1919	1920
UNMANUFACTURED—				
Crude rubber and gutta percha.*kilos*[1]	12,574	7,470	382,249	231,150
MANUFACTURED—				
Oiled and rubberized clothing.	13,730	3,996	75,072	150,586
Rubber in sheet, tubes, etc...	14,670	20,578	303,232	257,472
Rings, mats, etc.....	35,217	27,281	444,205	644,072
Footwear	51,653	57,979	417,375	562,427
Other rubber goods.....	6,363	21,880	58,247	64,893

EXPORTS OF CRUDE AND MANUFACTURED RUBBER

UNMANUFACTURED—				
Waste .....*kilos*[1]	17,187	2,500	115,010	139,585
MANUFACTURED—				
Rubberized fabric	2,924	1,945	21,601	26,090
Footwear, etc.	16	4,740	32	4,814

DENMARK

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	December		Year Ended December	
	1919	1920	1919	1920
UNMANUFACTURED—				
Crude rubber .....*kilos*[1]	32,600	30,200	705,900	507,700
MANUFACTURED—				
Footwear	55,900	28,100	225,800	219,600
Cycle tires.....	153,600	133,100	1,240,300	1,655,900
Hose	6,500	10,900	84,300	132,300
Manufactures of rubber combined with fabric.....	44,700	25,900	323,900	488,800
Manufactures of rubber without fabric.....	18,100	16,400	193,800	265,200

[1]One kilo equals 2.2 pounds.

RUBBER STATISTICS FOR SPAIN

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	Nine Months Ended September			
	1919		1920	
UNMANUFACTURED—	Kilos[1]	Pesetas[2]	Kilos	Pesetas
Crude rubber, gutta percha and similar materials:				
From Argentina	66,887		1,000	
Brazil	111,902		11,841	
United States.....	3,897		69,625	
France	1,844,946	19,969,462	1,641,160	19,969,207
Great Britain.....	516,502		1,002,638	
Peru	2,834		2,307	
Asia	167,233		193,051	
Other countries.....	358,024		150,564	
Totals	3,072,225	19,969,462	3,072,186	19,969,207
MANUFACTURED—				
Hose and tubes.....	53,637	504,188	104,484	982,150
Belting and packing.....	35,681	384,139	83,524	906,235
Solid tires armed with metal:				
From Germany	.....		7,390	
United States.....	75,063		79,314	
France	63,808	1,820,908	190,376	3,959,693
Great Britain.....	145,509		316,536	
Other countries.....	137		25,086	
Tires and tubes:				
From Germany	.....		2,245	
Belgium	1,554		6,984	
United States.....	187,658		498,248	
France	177,832	9,273,146	345,635	21,332,064
Great Britain.....	105,237		207,420	
Switzerland	.....		146	
Other countries.....	13,265		33,274	
Shoe elastic, garters, suspenders	21,197	413,341	44,087	859,696
Waterproofed fabrics, in pieces or cut out	32,609	635,875	84,370	1,645,215
Rubbered clothing, sewn or not	2,122	64,403	12,878	390,846
Footwear, combined or not with other materials.....	44,099	716,608	65,785	1,069,006
Other goods, excepting toys, instruments and writing materials	6,918	224,834	16,258	528,385
EXPORTS				
Rubber in sheets.....	18,692	224,304	16,571	198,852
Rubber in other forms.....	38,737	697,266	66,110	1,189,980

[1] One kilo equals 2.2 pounds.
[2] One peseta equals $0.193 (normal).

RUBBER STATISTICS FOR ITALY

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	Twelve Months Ended December			
	1919		1920	
UNMANUFACTURED—	Quintals[1]	Lire[2]	Quintals	Lire
Crude rubber and gutta percha —raw and reclaimed:				
From Great Britain	132		1,300	
French Colonies in Asia.	1,311		2,075	
British India and Ceylon.	25,579		7,412	
Straits Settlements.....	44,624	100,020,750	39,906	64,637,050
French African Colonies.	3,978		1,357	
Belgian Congo.....	1,033		2,116	
Brazil	27,712		10,596	
Other countries.....	916		3,277	
Totals	105,285	100,020,750	68,039	64,637,050
Rubber scrap	15,083	2,262,450	255	38,250
Totals, unmanufactured...	120,368	102,283,200	68,294	64,675,300
MANUFACTURED—				
India rubber and gutta percha—				
Threads	295	855,500	437	1,267,300
Sheets, including hard rubber	153	304,500	293	554,000
Tubes	228	335,450	223	418,350
Belting	603	994,950	805	132,825
Rubber-coated fabrics in pieces	531	1,119,000	868	1,734,800
Boots and shoes.....*pairs*	90,393	1,807,860	185,625	3,712,500
Other rubber footwear.....	2	3,000	2	3,000
Elastic webbing	363	1,234,200	804	2,733,600
Clothing and articles for travel	28	112,000	222	888,000
Tires and tubes:				
From Belgium	107		894	
France	4,314		5,270	
Great Britain.....	1,722	17,572,800	8,755	46,306,400
United States.....	126		1,388	
Other countries.....	7		231	
Germany (reparation)....	—		23	
Other manufactures.....	15,388	28,859,400	22,130	41,500,500
Totals, manufactured.....	.....	53,198,660	.....	99,251,275
Total imports.....	.....	155,481,860	.....	163,926,575

EXPORTS OF CRUDE AND MANUFACTURED RUBBER

UNMANUFACTURED—				
India rubber and gutta percha— raw and reclaimed:				
To Austria	.....		543	
Spain	2,155	2,380,500	1,020	2,911,500
United States	2,605		3,716	
Totals	4,761	2,380,500	5,823	2,911,500
Waste	4,842	968,400	9,058	1,811,600
Totals unmanufactured....	9,603	3,348,900	14,881	4,723,100
India rubber and gutta percha—				
Threads	503	1,559,300	397	1,230,700
Sheets, including hard rubber	89	189,400	327	615,600
Tubes	906	1,271,500	2,242	2,915,650
Belting	95	199,500	.....	.....
Rubber-coated fabrics in pieces	293	879,000	720	2,153,600
Boots and shoes.....*pairs*	64	1,280	612	12,240
Other rubber footwear.....	.....	.....	5	7,500
Elastic webbing	1,005	3,819,000	1,414	5,373,200
Clothing and articles for travel	167	835,000	885	4,425,000
Tires and tubes:				
To Austria	1,281		3,393	
Belgium	1,385		2,687	
Czecho-Slovakia	729		1,176	
Denmark	424		1,455	
France	1,160		2,484	
Great Britain.....	8,843		11,821	
Netherlands	225		541	
Roumania	236		1,685	
Spain	696	58,675,000	1,674	133,410,000
Switzerland	1,845		797	
Hungary	.....		264	
India and Ceylon.....	1,410		5,285	
Dutch East Indies.....	417		3,068	
Straits Settlements.....	271		2,853	
Australia	508		1,149	
Argentina	1,532		4,025	
Brazil	1,057		3,423	
Other countries.....	1,441		5,584	
Other rubber goods.....	4,604	8,517,600	15,595	28,739,000
Totals, manufactured.....	.....	75,946,580	.....	178,882,490
Total exports	.....	79,295,480	.....	183,605,590

[1] One quintal equals 220.46 pounds.
[2] One lira equals $0.193 (normal).

RUBBER STATISTICS FOR FRANCE

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

UNMANUFACTURED—	Year Ended December 1919 Quintals[1]	1919 Francs[2]	1920 Quintals	1920 Francs
Crude rubber and gutta percha—				
From Brazil	31,417		15,094	
England	113,054		159,640	
French Congo	5,168		1,814	
Senegal	3,213	243,419,000	792	215,701,000
Other French African Colonies	10,060		6,515	
British Indies	82,944		29,396	
Other countries	61,491		59,099	
Totals	307,347	243,419,000	272,350	215,701,000
MANUFACTURED—				
Pure rubber sheets, not vulcanized	7,544	22,632,000	12,511	37,533,000
Rubber thread	4,513	16,247,000	2,371	8,536,000
Elastic fabrics	750	3,000,000	691	2,764,000
Rubbered fabric in pieces	9,496	37,984,000	5,801	23,204,000
Articles made of rubbered fabric	8	48,000	22	132,000
Garment protectors	46	244,000	19	101,000
Garters, suspenders, belts	11	58,000	39	207,000
Rubberized clothing	3,508	22,802,000	776	5,044,000
Rubberized fabric for card clothing	220	462,000	329	691,000
Footwear	6,120	11,016,000	4,725	8,505,000
Tires, tubes, casings	80,553	217,493,000	49,153	132,713,000
Belting, hose, valves, etc.	25,675	31,013,000	19,911	29,867,000
Totals, manufactured	138,444	362,999,000	96,348	249,297,000

EXPORTS OF CRUDE AND MANUFACTURED RUBBER

UNMANUFACTURED—	Year Ended December 1919 Quintals[1]	1919 Francs[2]	1920 Quintals	1920 Francs
Crude rubber and gutta percha—				
To England	12,213		27,691	
United States	17,825	81,695,000	24,415	84,739,000
Germany			17,533	
Other countries	73,112		37,355	
Totals	103,150	81,695,000	106,994	84,739,000
MANUFACTURED—				
Sheets, unvulcanized and vulcanized threads	1,374	3,504,000	709	1,808,000
Elastic fabric	1,415	5,053,000	1,133	4,045,000
Rubberized fabric in pieces	798	2,848,000	2,642	9,432,000
Rubberized fabric for card clothing	642	1,328,000	2,580	5,335,000
Clothing	2,559	14,790,000	5,018	29,004,000
Articles of rubberized fabric	153	819,000	397	2,126,000
Footwear	1,148	1,952,000	15,479	26,314,000
Tires, tubes, casings:				
To England	.....		26,651	
Germany			4,530	
Belgium	85,138	217,101,000	14,388	353,545,000
Switzerland	.....		10,039	
Other countries	.....		83,137	
Totals	85,138	217,101,000	138,745	353,545,000
Belting, hose, valves, etc.	18,371	26,546,000	21,246	30,700,000
Totals, manufactured	111,598	273,941,000	187,949	462,309,999

[1]One quintal equals 220.46 pounds.
[2]One franc equals $0.193 (normal).

THE MARKET FOR RUBBER SCRAP

NEW YORK

THE rubber scrap market continues increasingly dull, only a small amount of buying is being done, and this by dealers only. There has hardly been such a thing as a scrap market.

The following revised freight classifications are of interest. Because of the impracticability of bundling large, heavy tires the consolidated classification committee will establish rating of fourth class, applicable in all territories, on so-called scrap tires, each weighing 50 pounds or over, when shipped loose.

QUOTATIONS FOR CARLOAD LOTS DELIVERED

June 24, 1921

Prices subject to change without notice

BOOTS AND SHOES			
Arctic tops	lb.	*$0.075	@
Boots and shoes	lb.	*.03½	@ .04
Trimmed arctics	lb.	*.02¼	@ .03
Untrimmed arctics	lb.	*.02	@ .02¼
HARD RUBBER			
Battery jars, black compound	lb.	*.07½	@ .01
No. 1, bright fracture	lb.	*.12	@ .15
INNER TUBES			
No. 1	lb.	*$0.06	@$0.06¼
Compounded	lb.	*.04¼	@ .04½
Red	lb.	*.04¼	@ .04¾
MECHANICALS			
Black scrap, mixed, No. 1	lb.	*.02½	@ .03
No. 2	lb.	*.01½	@ .02
Car springs	lb.	*.02½	@ .03
Heels	lb.	*.02½	@ .03
Horse-shoe pads	lb.	*.02½	@ .03
Hose, air brake	lb.	*.01	@ .01½
fire, cotton lined	lb.	*.01	@
garden	lb.	.07	@ .01
Insulated wire stripping, free from fiber	lb.	*.01½	@ .02
Matting	lb.	*.01	@
Red packing	lb.	*.04½	@ .05
Red scrap, No. 1	lb.	*.07	@ .08
No. 2	lb.	*.05½	@ .06
White scrap, No. 1	lb.	*.07	@ .07½
No. 2	lb.	*.06	@ .06½
TIRES			
PNEUMATIC—			
Auto peelings	lb.	*.02	@ .02¼
Bicycle	lb.	*.01½	@ .02
Standard white auto	lb	*.02¼	@ .02¾
Mixed auto	lb.	*.01	@ .01½
Stripped, unguaranteed	lb	*.01	@ .01½
White, G. & G., M. & W., and U. S.	lb.	*.02¾	@
SOLID—			
Carriage	lb.	*.02¼	@ .02¾
Ironv	lb.		@
Truck, clean	lb.	*.01½	@ .02

*Nominal.

THE MARKET FOR COTTON AND OTHER FABRICS

NEW YORK

MANUFACTURES of cotton composed of a staple of 1⅜ inches or more, which are dutiable under the new Emergency Tariff Law, are subject to seven cents a pound additional duty to the rates in the Tariff Act of 1913, and include tire fabrics, cotton canvas and duck.

The method of determining the length of the staple is as follows: "A number of fibers are gradually worked into a parallel condition and afterwards a small tuft is extracted. This operation is performed by taking a handful of cotton, and while holding it fairly firm with one hand, the tuft is broken by the other hand, and the loose fibers gently removed; then a number of fibers are gripped by the forefinger and thumb and drawn gradually out of the bulk and if the majority of said fibers measure 1⅜ inches or over in length it can then be safely assumed that such cotton will fall under the provisions of paragraph 16 of the Emergency Tariff Act."

The only cottons imported that have such lengths are Sakellarides, Abassi, white and brown Egyptian and certain grades from Peru, West Indies and Brazil.

The obvious result of this tax will be that manufacturers will use shorter cotton more extensively but, as a protective measure, it may be disappointing to Arizona growers who should reduce costs in order to compete in the world's markets.

AMERICAN COTTON. The market trend for the past month has been downward with spot values in the South at the lowest figures recorded for the season and the last five years. Trade buying for future requirements is liable to continue as consumers realize that American cotton acreage has been reduced 30 per cent, and fertilizer 50 per cent which would result in a small crop under unfavorable weather and other adverse conditions.

Spot middling uplands has ranged in price from 12.95 cents earlier in the past month to 10.85 cents on June 20.

EGYPTIAN COTTON. While the market for extra staple has been comparatively easy, prices have not declined as much as the almost entire lack of business would forecast. Good grade Uppers were quoted at 14 to 16 cents and medium grade Sakel at 20 to 23 cents. Top grades are worth approximately 30 cents.

The Egyptian crop is progressing favorably and is rapidly making up for the late start which it had this season. Thus far the weather conditions in Egypt have been very similar to those in our own South. The Department of Agriculture in Egypt has recently decreed that a reduced acreage must be planted in 1922 and 1923, but this may be modified by conditions.

ARIZONA COTTON. There is practically no change in Pima cotton which is quoted 30 to 32 cents.

SEA ISLAND. There has been some inquiry for Sea Islands that indicates that better than 40 cents would be paid for extra choice. It is understood that the acreage in the South this year under Sea Island cotton is somewhat larger than last year but it is doubtful if more than 3,000 bales are raised altogether, unless the boll-weevil can be successfully subdued.

MECHANICAL DUCKS AND DRILLS. Very little improvement has been noted in the demand for these materials, which has been confined wholly to replacement orders. Quotations have indicated a lower range of prices.

RAINCOAT FABRICS. Business has been very dull in these fabrics as the present period is between seasons. Dealers do not expect much activity in this market before fall.

SHEETINGS. The decline in cotton late in June resulted in an easier market for sheetings, and lower prices. Buying has been spasmodic and orders could be obtained for only absolutely necessary requirements. The indications are that this market will be very quiet during the summer months.

TIRE FABRICS. The tire fabric market is very much like the market for tires. It is really demoralized as to prices, and the mills are unable to give quotations that represent market values. Quotations from different sources vary from 15 to 20 cents a pound, and therefore, the figures given in the following list of tire fabrics are what may be considered as fair market values.

NEW YORK QUOTATIONS

June 24, 1921

Prices subject to change without notice

BURLAPS			
32—7-ounce	100 yards	*$3.50	@
32—8-ounce		*3.50	@
40—7½-ounce		*4.00	@
40—8-ounce		*4.00	@
40—10-ounce		*4.50	@
40—10½-ounce		*4.50	@
45—7½-ounce		*4.50	@
45—8-ounce		*4.50	@
45—10-ounce		*5.00	@
DRILLS			
38-inch 2.00-yard	yard	.12	@
40-inch 3.47-yard		.07¾	@
52-inch 1.90-yard		.14	@
52-inch 1.95-yard		.13¾	@
60-inch 1.52-yard		.17½	@
DUCK			
CARRIAGE CLOTH			
38-inch 2.00-yard enameling duck	yard	.13	@
38-inch 1.74-yard		.15	@
72-inch 16.66 ounce		.31¼	@
72-inch 17.21-ounce		.32¾	@
MECHANICAL			
Hose	pound	.25	@
Belting		.25	@
HOLLANDS, 40-INCH			
Acme	yard	.20	@
Endurance		.22	@
Penn		.26	@
Flat finish		.23	@
Dead finish		.26	@
Lonsdale or Sunfast.			
White		.59	@
Dark green or blue		.66	@
Colors		.61	@
Piece goods, 40-inch			@
Piece goods, 36-inch			@
RAINCOAT FABRICS			
COTTON			
Bombazine 64 x 60	yard	.12½	@
60 x 48		.11½	@
Cashmeres, cotton and wool, 36-inch, tan		.65	@
Twills 64 x 72		.10	@ .12
60 x 102		.16	@
Twill, mercerized, 36-inch, blue and black		.26½	@
tan and olive		.24½	@
Tweed		$0.40	@ 1.00
printed		.18	@
Plaids 60 x 48		.10	@
56 x 44		.11	@
Repp		.25	@
Prints 60 x 48		.13	@
64 x 60		.14	@
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES			
63-inch, 3¼ to 7½ ounces	yard	1.00	@ 2.50
36-inch, 2¾ to 5 ounces		.60	@ 1.50
IMPORTED PLAID LINING (UNION AND COTTON)			
63-inch, 3½ to 7 ounces	yard	.60	@ 1.37½
36-inch, 2 to 4 ounces		.37½	@ .80
SHEETINGS, 40-INCH			
48 x 48, 2.35-yard	yard		@
48 x 48, 2.50-yard		.09½	@
48 x 48, 2.85-yard		.08¼	@
64 x 68, 3.15-yard		.09½	@
56 x 60, 3.60-yard		.08	@
48 x 44, 3.75-yard		.06¾	@
SILKS			
Canton, 38-inch	yard	.27½	@
Schappe, 36-inch		.47½	@
STOCKINETTES			
SINGLE THREAD			
3½ Peeler, carded	pound		@
4½ Peeler, carded			@
6½ Peeler, combed			@
DOUBLE THREAD			
Zero Peeler, carded	pound		@
3½ Peeler, carded			@
6½ Peeler, combed			@

TIRE
FABRICS

JENCKES
SPINNING
COMPANY

PAWTUCKET
RHODE ISLAND

AKRON OFFICE
Second National Building

NEW YORK OFFICE
25 West 43d Street

TIRE FABRICS

BUILDING				
17¼-ounce Sakellarides, combed	pound	$0.80	@	$0.85
17¼-ounce Egyptian, combed		.70	@	.80
17¼-ounce Egyptian, carded		.65	@	.75
17¼-ounce Peelers, combed		.70	@	.75
17¼-ounce Peelers, carded		.55	@	
CORD				
15-ounce Egyptian	pound	.80	@	.85
BICYCLE				
8-ounce American	pound		@	
10-ounce American			@	
CHAFER				
9¼-ounce Sea Island	pound	1.00	@	
9¼-ounce Egyptian, carded		.80	@	.90
9¼-ounce Peeler, carded		.70	@	

*Nominal.

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS

NEW YORK

DURING the past month the market for chemicals and compounding ingredients has not maintained the improvement noted the month previous, except in the case of lithophone, where the improvement was attributable to the demand for it from the paint more than from the rubber trade.

As yet, revival of rubber manufacturing is not in marked evidence. Akron news from the tire division indicates some increase of activity but improvement has not been noted in other lines during the past month.

ANILINE OIL. Demand has continued dull and prices depressed ruling 19 to 25 cents a pound.

BARYTES. Some foreign imports were offered but not enough to affect the market. In general, demand has been routine or dull except on the part of makers of lithopone, who are manufacturing their product under a satisfactorily brisk demand.

BENZOL. The call for both grades has been well-maintained, with prices firm, ranging for 90 per cent grade from 25 to 31 cents a gallon and for the pure grade from 27 to 33 cents a gallon.

BLANC FIXE. A slightly improved demand was noted early in the month but in general the business became routine and dull.

BLUE LEAD. The demand has been steadily moderate following the lead of the other lead pigments.

CARBON BLACK. Prices have been cut to a level that seems to ensure a continuous and fair business.

CARBON BISULPHIDE. Only light buying has been experienced from the rubber trade. In general the demand has declined to very moderate proportions.

CARBON TETRACHLORIDE. Beginning the month in brisk request—at the end there was no call from the rubber trade.

CHINA CLAY. There has been a fair call supplied to a considerable extent by large arrivals from England. This material of domestic production is at serious disadvantage owing to the prevailing high freight rates which curtail its movement to the market.

DRY COLORS. In all lines dry colors rule quiet. Further price reductions are opposed by the producing interests.

LITHARGE. The purchase of litharge by consumers has continued somewhat restricted the entire month.

LITHOPONE. The demand has held very brisk and satisfactory for weeks. Producers have been operating at capacity. Prices have remained steady at 7 cents a pound for bags and 7½ for barrels.

SOLVENT NAPHTHA. The proofing trade, which is a large consumer, is particularly inactive at present. Prices are lower on certain grades.

SULPHUR. Demand has been only routine in character.

TALC. Early in the month there was ample supply on hand with no foreign arrivals and prices steady. During the last week foreign stocks appeared and demand dropped to routine proportions.

WHITING. Ample stocks of chalk are coming in which are being taken largely by the whiting makers. Business has continued fair.

ZINC OXIDE. Week by week an improvement has been noted and during the last week demand from the automobile tire manufacturers has been reported.

NEW YORK QUOTATIONS

June 24, 1921

Prices subject to change without notice

ACCELERATORS, ORGANIC				
Accelerene (f. o. b. English port)	lb.	13s.	@	
Accelemal (bbl.)	lb.	$0.60	@	
Adeo	(kegs) lb.	.65	@	
Aldehyde ammonia crystals	lb.	.95	@	1.00
Aniline oil	lb.	.19	@	.25
Excellerex	lb.	.70	@	.75
Formaldehyde aniline	lb.	.60	@	.65
Hexamethylene tetramine	lb.	.95	@	1.00
Lead oleate (bbls. factory)	400 lbs.	.20	@	
N. C. C.	lb.	.45	@	
No. 999	lb.	.14½	@	
Paradin	lb.	.65	@	
Paraphenylene diamine	lb.	1.75	@	2.00
Thiocarbanilide	lb.	.45	@	.70
Vulcocene	lb.	.35	@	
X L O	lb.	1.50	@	2.00
ACCELERATORS, INORGANIC				
Lead, dry red	lb.	.10	@	
sublimed blue	lb.	.07¼	@	.07½
sublimed white	lb.	.07¼	@	.08
white, basic carbonate	lb.	.07½	@	.08
Lime, flour	lb.	.02½	@	
Superfine	lb.	.03	@	
Litharge, domestic	lb.	.09¾	@	
imported	lb.	.17	@	
sublimed	lb.		@	
Magnesium, carbonate, light	lb.	.09	@	
oxide, calcined light	lb.	.27	@	.30
calcined heavy	lb.	.06½	@	.08½
ACIDS				
Acetic 28 per cent	lb.	.02½	@	
glacial, 99 per cent	cwt.	11.00	@	11.75
Cresylic (97% straw color)	gal.	.85	@	.87
(95% dark)	gal.	.80	@	.82
Muriatic, 20 degrees	lb.	.02	@	
Nitric, 36 degrees	lb.	.05¾	@	
Sulphuric, 66 degrees	lb.	.01½	@	
ALKALIES				
Caustic soda (factory)	lb.	.03⅞	@	.04¼
Soda ash, 58%	cwt.	1.90	@	2.25
COLORS				
Black				
Bone, powdered	lb.	.06½	@	.14
granulated	lb.	.11	@	
Carbon black (sacks, factory)	lb.	.09	@	.14
pressed	lb.	.10	@	.15
Dipped goods	lb.	1.00	@	
Drop	lb.	.08	@	.16
Ivory black	lb.	.17	@	.45
Lampblack	lb.	.10½	@	.45
Oil soluble aniline	lb.	.95	@	
Rubber black	lb.	.10	@	.16
Rubber makers' non-flying black	lb.	.40	@	
Blue				
Cobalt	lb.	.25	@	.30
Dipped goods	lb.	1.00	@	
Prussian	lb.	.60	@	
Rubber makers' blue	lb.	3.50	@	
Ultramarine	lb.	.16	@	.35
Brown				
Iron oxide	lb.	.05	@	.07
Sienna, Italian, raw and burnt	lb.	.05	@	.07
Sienna, Italian, raw (tan color)	lb.	.06	@	.14
Umber, Turkey, raw and burnt	lb.	.05	@	.07
Vandyke	lb.	.06	@	.08
Green				
Chrome, light	lb.	.36	@	.40
medium	lb.	.40	@	.52
dark	lb.	.52	@	.58
commercial	lb.	.13½	@	
tile	lb.	.08	@	.17
Guignet	lb.	1.50	@	
Dipped goods	lb.	1.00	@	
Oxide of chromium	lb.	.55	@	.70
Rubber makers' green	lb.	3.50	@	
Red				
Antimony, crimson	lb.	.44	@	
crimson, F	lb.	.35	@	
crimson, R. M. P.	lb.	.55	@	
Antimony, golden	lb.	.28	@	
golden, R. M. P.	lb.	.25	@	
golden 1	lb.	.30	@	
golden 2	lb.	.25	@	
7-A	lb.	.42	@	
vermilion	lb.	.55	@	
red	lb.	.25	@	
Arsenic, red sulphide	lb.	.13½	@	
Dipped goods, red	lb.	1.25	@	
purple	lb.	1.00	@	
orange	lb.	1.25	@	
Indian	lb.	.13½	@	
Iron oxide, reduced grades	lb.	.04	@	.12
pure bright	lb.	.15½	@	

COLORS—Continued

Maroon oxide	lb.	$0.13½	@
Oil soluble aniline, red	lb.	1.75	@ 2.00
orange	lb.	1.50	@
Oximony	lb.	.17½	@
Para toner	lb.	1.60	@
Red excelsior	lb.		@
Rubber-makers' red (four shades)	lb.	3.50	@
purple	lb.	2.50	@
Spanish natural	lb.	.05	@ .06
Toluidine toner	lb.	3.00	@ 3.25
Venetian	lb.	.03	@ .06
Vermilion, American	lb.	.25	@ .30
permanent	lb.	.32	@
English quicksilver	lb.	1.10	@ 1.20
White			
Albalith	lb.	.07	@ .07¼
Aluminum bronze, extra brilliant	lb.		@
extra fine	lb.		@
Lithopone, Beckton white	lb.	.07	@ .07½
Lithopone, domestic (factory)	lb.	.07	@ .07½
Ponolith (carloads, factory)	lb.		@
Rubber-makers' white	lb.		@
		C.L.	L.C.L.
Zinc oxide. American Horse Head (factory)	lb.	.08¾ @	.09¼
Special	lb.	.09¼ @	.09¾
XX red	lb.	.08¾ @	.09¼
French process, Florence brand (factory):			
White seal	lb.	.12¼ @	.12½
Green seal	lb.	.11 @	.11½
Red seal	lb.	.10 @	.10½
White seal	lb.	.12¼ @	.12½
Azo (factory):			
ZZZ (lead free)	lb.	.08¾ @	.09¼
ZZ (under 5% leaded)	lb.	.08 @	.08½
Z (8-10% leaded)	lb.	.07½ @	.08½
Yellow			
Arsenic, yellow sulphide	lb.	.70	@
Cadmium, sulphide, yellow, light, orange	lb.		@
red	lb.		@
Chrome, light and medium	lb.	.21	@
C. P.	lb.	.21	@
Dipped goods	lb.	1.25	@
Ochre, domestic	lb.	.02½ @	.03½
imported	lb.	.03½ @	.05½
Oil soluble aniline	lb.	1.60	@
Rubber makers' yellow	lb.	2.50	@ 3.50
Zinc chromate	lb.	.40	@

COMPOUNDING INGREDIENTS

Aluminum flake (carload)	ton	33.00	@
hydrate, light	lb.	.22	@ .25
Ammonium carbonate (lump)	lb.	.07½	@ .10
Asbestine	ton	20.00	@25.00
Barium, carbonate	ton	60.00	@70.00
dust	ton	85.00	@
Barytes, pure white (f. o. b. works)	ton	28.00	@
off color, carload	ton	20.00	@
uniform floated, carload	ton	28.00	@
Basofor	lb.	.05	@
Beta-naphthol	lb.	.37½	@ .40
Blanc fixe	lb.	.04½	@
Bone ash	lb.		@
Carrara filler (factory)	ton.	16.00	@
Chalk, precipitated, extra light (f. o. b. factory)	lb.	.03½	@ .04¼
heavy (f. o. b. factory)	lb.	.02½	@ .03¼
China, clay, Dixie	ton	22.00	@
Blue Ridge	ton	22.00	@
domestic	ton	7.50	@ 9.00
imported	ton	16.00	@24.00
Cotton linters, clean mill run (factory)	lb.	.01¾	@ .02¼
Diatomite	lb.	.03½	@
Fossil flour (powdered)	ton	60.00	@
(bolted)	ton	65.00	@
Glue, high grade	lb.	.30	@ .40
medium	lb.	.24	@ .30
low grade	lb.	.17	@ .19
Graphite, flake (400-pounds bbl.)	lb.	.10	@
amorphous	lb.	.05	@
Ground glass FF. (bbls.)	lb.		@
Infusorial earth (powdered)	ton	60.00	@
(bolted)	ton	65.00	@
Liquid rubber	lb.	.15½	@
Mica, powdered	lb.	.15	@
Phenanthrene	lb.	.08	@ .10
Pumice stone, powdered (bbl.)	lb.	.03	@ .08
Rotten stone, powdered	lb.	.02½	@ .04½
Rubber paste	lb.		@
Silica, aluminum	ton	25.00	@28.00
gold bond	ton	28.00	@
silver bond	ton	22.00	@
Soap bark, crushed	lb.	.12	@ .13
Soapstone, powdered gray (carload)	ton	12.00	@
Starch, powdered corn (bags)	cwt.	2.43	@
(bbls.)	cwt.	2.81	@
Talc, powdered soapstone	ton	20.00	@25.00
Terra blanche	ton	22.00	@25.00
Tripoli flour, air-floated, cream or rose (factory)	ton	30.00	@
white (factory)	ton	32.00	@
Tyre-lith	ton	95.00	@
Whiting, Alba	cwt.	15.00	@18.00
Columbia	cwt.		@
commercial	cwt.	1.15	@ 1.20
Danish	ton	18.00	@
English cliffstone	cwt.	1.75	@ 2.00
gilders	cwt.	1.20	@ 1.35
Paris, white, American	cwt.	1.40	@ 1.50
Quaker	ton	13.00	@
Super	ton		@
Wood pulp, imported	ton		@
XXX (f. o. b. plant)	ton	36.00	@
X (f. o. b. plant)	ton	35.00	@
Wood flour	ton	35.00	@40.00

MINERAL RUBBER

Elateron (c. l. factory)	ton		@
(l. c. l. factory)	ton		@
Gilsonite	ton	$70.00	@
Genasco (c. l. factory)	ton	50.00	@
(l. c. l. factory)	ton	52.00	@
Hard hydrocarbon	ton	35.00	@45.00
Soft hydrocarbon	ton	35.00	@40.00
320 M. P. hydrocarbon (c. l. factory)	ton	50.00	@55.00
(l. c. l. factory)	ton	57.50	@
300/310 M. P. hydrocarbon (c. l. factory)	ton	40.00	@
(l. c. l. factory)	ton	45.00	@
M. R. X	ton		@
Pioneer, M. R. (c. l. factory)	ton	46.00	@
(l. c. l. factory)	ton	48.00	@
Raven M. R.	ton		@
Robertson, M. R. pulverized (c. l. factory)	ton	87.50	@
M. R pulverized (l. c. l. factory)	ton	90.00	@
M. R. (c. l. factory)	ton	62.50	@
M. R. (l. c. l. factory)	ton	65.00	@
Rubrax (factory)	ton	50.00	@
States "A" (l. c. l. factory)	ton	45.00	@
No. 1 (l. c. l. factory)	ton	40.00	@
Synpro, granulated, M. R. (factory)	ton	60.00	@72.50

OILS

Avoilas compound (bbl.)	lb.	.16	@
(kegs)	lb.	.18	@
Castor, No. 1, U. S. P.	lb.	.11	@
No. 3, U. S. P.	lb.	.09	@
Corn	lb.	.07½	@
refined	cwt.	9.10	@
Cotton	lb.	.08	@
Glycerine (98 per cent)	lb.	.18	@ .19
Linseed, raw	gal.	.73	@
Linseed compound	gal.		@
Palmoline	lb.	.10	@ .13
Palm niger	lb.	.06¾	@
Peanut	lb.	.08	@
Petrolatum, standard	lb.	.06	@ .08
Petrolatum, sticky	lb.	.08	@ .10
Pine, steam distilled	gal.	1.12	@ 1.35
Rapeseed, refined	lb.	.07½	@
blown	lb.	.08	@
Rosin	gal.	.40	@ .43
Synpro	gal.	.38	@ .65
Soya bean	lb	.07½	@
Tar	gal.	.32	@ .34

RESINS AND PITCHES

Cantella gum	lb.	.50	@
Cumar resin, hard	lb.	.09	@ .13
soft	lb.	.09	@ .13
Tar, retort	bbl.	12.00	@
kiln	bbl.	11.00	@11.50
Pitch, Burgundy	lb.	.05	@
coal tar	ton	25.00	@
pine tar	lb.	.03½	@
ponto	lb.	.10	@
Rosin, K (bbl.)	280 lbs.	5.80	@
strained (bbls.)	280 lbs.	5.40	@
Shellac, fine orange	lb.	.90	@

SOLVENTS

Acetone (98.99 per cent, drums [6.62 lbs. per gal.])	lb.	.12½	@ .13½
Benzol (water white, 90% [7.21 lbs. per gal.])	gal.	.25	@ .31
pure (drums, extra)	gal.	.27	@ .33
Carbon bisulphide (drums [10.81 lbs. per gal.])	lb.	.07	@ .07½
tetrachloride (drums [13.28 lbs. per gal.])	lb.	.11	@ .13½
Paracymene (factory)	gal.	1.00	@
Motor gasoline (steel bbls.)	gal.	.24½	@
73@76 degrees (steel bbls.)	gal.	.37½	@
68@70 degrees (steel bbls.)	gal.	.35	@
Naphtha, V. M. & P. (steel bbls.)	gal.	.25	@
solvent (drums extra)	gal.	.28	@
Toluol, pure (7.21 lbs. per gal.)	gal.	.28	@ .34
Turpentine, spirits	gal.	.62	@
wood	gal.	.60	@
Xylol, pure (7.21 lbs. per gal.)	gal.	.40	@ .43
commercial	gal.	.28	@ .35

SUBSTITUTES

Black	lb.	.08	@ .15
White	lb.	.10	@ .17
Brown	lb.	.12	@ .16
Brown factice	lb.	.07	@ .15
White factice	lb.	.08	@ .17
Paragol, soft and medium	cwt.	6.81	@
hard	cwt.	6.81	@

VULCANIZING INGREDIENTS

Lead, black hyposulphite (black hypo)	lb.	.40	@
Orange mineral, domestic	lb.	.11¼	@ .13½
Sulphur chloride (jugs)	lb.	.18	@ .20
(drums)	lb.	.07	@ .08½
Sulphur, flour, Brooklyn brand (carloads)	cwt.		@
Brooklyn brand (less carload)	cwt.		@
Bergenport brand (bbls.)	cwt.	2.55	@
(bags)	cwt.	2.30	@
superfine (carloads, factory)	cwt.		@

(See also Colors—Antimony.)

WAXES

Wax, beeswax, white, commercial	lb.	.55	@
ceresin, white	lb.	.14	@
carnauba	lb.	.20	@
Montan	lb.	.09	@
ozokerite, black	lb.	.30	@
green	lb.	.30	@
paraffin	lb.	.03½	@ .08
sweet wax	lb.	.12	@

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TABLE OF CONTENTS

Pages

Editorials
Statistics, Standardization and Saving ... 715
Financing for Export ... 715-716
Profit Rather Than Volume ... 716
Minor Editorial ... 716

The Manufacture of Dipped Goods. By John Hadfield. Illustrated ... 717-721

Comparative Summary for the Manufacture of Rubber Goods, 1919 and 1914 ... 721

The River of Gutta ... Illustrated 722

A Glossary of Words and Terms Used in the Rubber Industry—VI. By Henry C. Pearson ... 723-725

Progress of the Malayan Rubber Restriction Movement. By Richard Hoadley Tingley ... 725-727

Tire Production in the United States ... Graphs 728-730

Rubber Accelerator Service Laboratories ... Illustrated 730

Interesting Letters from Our Readers ... 730

Repairing Rubber Gloves and Mittens—V. Illustrated 731-734

Obituary Record ... 735
F. W. Morgan (portrait). K. G. Roebling. W. H. Sayen. R. E. Oakley. W. L. Candee.

New Trade Publications ... 736

The Editor's Book Table ... 736
"Credits: How to Avoid Commercial Losses (Including Cancellations and Returns)." "The Motor Truck Terminal." "A French-English Dictionary for Chemists."

American Society for Testing Materials ... 737-738

Chemistry
What the Rubber Chemists Are Doing ... 739-740
Chemical Patents ... 740-741
Laboratory Apparatus ... Illustrated 741

Carbons and Hydrocarbons Used in the Rubber Industry. By Frederic Dannerth, Ph. D. ... 742-744

The Action of Certain Organic Accelerators in the Vulcanization of Rubber—III. By G. D. Kratz, A. H. Flower and B. J. Shapiro ... 744-745

New Machines and Appliances ... Illustrated 746-748
Standard Tire Calenders. Motor-Power Roll Adjustment for Calenders. Continuous Cord-Tire Fabric Machine. Akron Rubbermold Truck-Tire Vulcanizer. "Ideal" Tumbling Barrels. Sifting Reel for Dry Compounding Ingredients.

Machinery Patents ... Illustrated 748-749
Machine for Making Tire Casings. Automatic Machine for Mixing Rubber. Apparatus for Recovering Volatile Solvents. Other Machinery Patents.

Process Patents ... 749

The Planning of a Cotton Mill for Tire Fabrics. By G. Joseph Nord ... Illustrated 750-752

The International B. F. Goodrich Corporation ... 752-753

The International Acceptance Bank. Portrait of Charles B. Seger ... 753

Inquiries and Trade Opportunities ... 753-754

Final Declaration of the Eighth National Foreign Trade Convention. Portrait of E. H. Huxley ... 754

New Goods and Specialties ... Illustrated 755-757
Up-to-Date Manicuring. Rubber-Lined Money-Belt. British Solid Rubber Cable. Combination Window Washer and Duster. Electrical Beauty Device. Cross-Strap Sandal for Summer. Rubber Launching Device for Toy Airplanes. Ideal Fastening for Tobacco Pouches. Styles in German Raincoats. Metallic Reinforced Fabric Pneumatic Tire. Baby on Pneumatic Tires and Maid Untired. Cord Tires from Coast to Coast. The Clark Pedmobile.

The Rubber Association of America—Activities of ... 758

American Rubber Trade—News and Personals
New Incorporations ... 759
Dividends ... 759
Rubber Stock Quotations ... 759-760
John V. Mowe ... Portrait and Sketch 760
East and South ... By Our Correspondent 760-761
New Jersey ... By Our Correspondent 761-762
Rhode Island ... By Our Correspondent 762-763
Massachusetts ... By Our Correspondent 763-764
Edward G. Wilmer ... Portrait and Sketch 765
Ohio ... By Our Correspondent—Illustrated 765-767
Mid-West ... By Our Correspondent 767-768
Pacific Balloon Co ... Illustrated 768-769
Pacific Coast ... By Our Correspondent 769-770
Canadian Notes ... Illustrated 770

Foreign Rubber News
Great Britain ... By Our Correspondent 771-772
The Rubber Trade of France in 1920 ... 772-773
Europe ... 773-774
Foreign Tariffs ... 774-775

Planting
Far East ... By Our Correspondent 775-776

Patents Relating to Rubber ... 777-778
United States. Canada. United Kingdom. New Zealand.

Trade Marks ... 778-779
United States. Canada. United Kingdom.

Vulcanization Accelerator Patents ... 780-781

Ocean Rates from New York on Tires, Tubes, Mechanical Goods, Clothing, Footwear, and Druggists' Sundries ... 781

Markets
Crude Rubber ... 782
New York Average Spot Rubber Prices ... 783
Highest and Lowest New York Prices ... 783
Amsterdam Rubber Market ... 783
Antwerp Rubber Market ... 783
Singapore Rubber Market ... 783
Reclaimed Rubber ... 782-783
Rubber Scrap ... 792
Cotton and Other Fabrics ... 792-794
Chemicals and Other Ingredients ... 794-795

Statistics
Canada, Statistics for March, 1921, and for Fiscal Year Ended March ... 790
Ceylon Rubber Exports ... 784
Denmark, Statistics for Twelve Months Ended December, 1919 and 1920 ... 791
Federated Malay States Rubber Exports ... 784
France, Statistics for Twelve Months Ended December, 1919 and 1920 ... 792
Italy, Statistics for Twelve Months Ended December, 1919 and 1920 ... 791
Java Rubber Exports, January to March, 1921 ... 789
January to April, 1921 ... 784
Malaya Rubber Exports ... 784
Norway, Statistics for Eleven Months Ended November, 1919 and 1920 ... 791
Penang Rubber Exports ... 784
Spain, Statistics for Nine Months Ended September, 1919 and 1920 ... 791
Straits Settlements Rubber Exports ... 784
Sweden, Statistics for Twelve Months Ended December, 1919 and 1920 ... 791
United Kingdom, Statistics for April, 1921 ... 789

United States:
Crude Rubber Arrivals at Atlantic and Pacific Ports as Stated by Ships' Manifests ... 784-785
Custom House Statistics ... 788-789
Exports of India Rubber Manufactures During March, 1921 (By Countries) ... 786-787
Imports by Months for 1921 ... 788
Statistics for March, 1921 ... 787